

# TONE GENERATOR

# MU100R

## SERVICE MANUAL



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SY 011370

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**YAMAHA CORP.**

HAMAMATSU, JAPAN

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IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

**WARNING:** Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

**IMPORTANT:** This presentation or sale of this manual to any individual or firm does not constitute authorization, certification, recognition of any applicable technical capabilities, or establish a principal-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and changes in specification are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

**WARNING:** Static discharges can destroy expensive components. Discharge any static electricity you body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss.)

**IMPORTANT:** Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

LITHIUM BATTERY HANDLING

This product uses a lithium battery for memory back-up.

**WARNING:** Lithium batteries are dangerous because they can be exploded by improper handling. Observe the following precautions when handling or replacing lithium batteries.

- Leave lithium battery replacement to qualified service personnel.
- Always replace with batteries of the same type.
- When installing on the PC board by soldering, solder using the connection terminals provided on the battery cells. Never solder directly to the cells. Perform the soldering as quickly as possible.
- Never reverse the battery polarities when installing.
- Do not short the batteries.
- Do not attempt to recharge these batteries.
- Do not disassemble the batteries.
- Never heat batteries or throw them into fire.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

VARNING

Explosionsfara vid felaktigt batteribyte.  
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.  
Kassera använt batteri enligt fabrikantens instruktion.

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.  
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.  
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

The following information complies with Dutch Official Gazette 1995. 45; ESSENTIALS OF ORDER ON THE COLLECTION OF BATTERIES.

- Please refer to the diassembly procedure for the removal of Back-up Battery.
- Leest u voor het verwijderen van de backup batterij deze beschrijving.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHAT SO EVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!




If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

■ WARNING

Components having special characteristics are marked △ and must be replaced with parts having specification equal to those originally installed.

△印の商品は、安全を維持するために重要な部品です。交換する場合は、安全のため必ず指定の部品をご使用下さい。

SPECIFICATIONS

<b>Tone Generation Method</b> AWM2 (Advanced Wave Memory 2), Virtual Acoustic Synthesis System (VL)	<b>Controls</b> VOLUME control; A/D INPUT level control; Mode select buttons: PLAY, UTIL (UTILITY), MODE, EDIT, EFFECT; EQ; other buttons: MUTE/SOLO, ENTER, EXIT, PART  , SELECT  , VALUE  ; data dial; POWER button
<b>Maximum Simultaneous Polyphony</b> 64-note + 1-note (VL)	<b>Jacks and Terminals</b> Front panel: PHONES jack (1/4"), A/D INPUT 1, 2 jacks (1/4"), Rear panel: INDIVIDUAL OUTPUT 1, 2 jacks; OUTPUT R, L/MONO jacks (Right, Left/Mono); DC IN jack; TO HOST terminal; HOST SELECT switch; MIDI IN A/B, MIDI OUT, and MIDI THRU terminals
<b>Sound Module Modes</b> XG (Extended General MIDI), TG300B, C/M, and Performance	<b>Computer/MIDI Interface</b> Direct connection to host computer port (RS-232C, RS-422) with optional cables (CCJ-PC1, CCJ-PC1, CCJ-MAC); MIDI terminals allow connection to MIDI sequencer or MIDI controller
<b>Multi-timbral Capacity</b> 32-Part (on 32 MIDI channels; with element reserve priority for later notes and dynamic Voice allocation)	<b>Data Transfer (Baud) Rate</b> MIDI — 31,250 bps (bits per second) Mac — 31,250 bps PC-1 — 31,250 bps PC-2 — 38,400 bps
<b>Internal Voice/Program Structure</b> <b>Normal Programs</b> Total Voices ..... 1267 + 256 (VL) XG mode ..... 1074 + 256 (VL) TG300B mode ..... 614 C/M mode ..... 128 (Parts 1 — 9), 64 (Parts 11 — 16) <b>Drum Programs</b> Total Programs ..... 46 XG mode ..... 36 TG300B mode ..... 10 C/M mode ..... 1	<b>Power Supply</b> Yamaha PA-5B AC Adaptor (included)
<b>Performance Programs</b> Up to four Voices plus all effect settings can be memorized to a Performance. Preset Programs ..... 100 User Programs ..... 100	<b>Dimensions (W × D × H)</b> 483 × 229 × 44 mm (19" × 9" × 1-3/4")
<b>Effects</b> Six sections of multi-effects: Reverb (12 Types), Chorus (14 Types), Variation (70 Types), Insertion 1, 2 (43 Types), Harmony (4 Types), Effect and EQ (4 Types)	<b>Weight</b> 2.4 kg (5 lbs., 5 oz.)
<b>Display</b> Custom back-lit LCD	<b>Included Accessories</b> Owner's Manual, Yamaha PA-5B AC Adaptor Floppy Disk
	<b>Output Level</b> Refer to the TEST PROGRAM section of this manual.

■ 総合仕様

1. 機能

音源	AWM2音源
最大同時発音数	64音
サウンドモジュールモード	XG, TG300B (GM-B), C/M, Performance
発音方式	32チャンネル・マルチティンバー エレメントリザーブ付後着優先、DVA
エフェクター	6基搭載 リバーブ、コーラス、バリエーション、インサーション1,2、イコライザー
インターフェース機能	ケーブル (CCJ-PC1, CCJ-PC2, CCJ-MAC, CCJ-PC1NF) にてRS-232C、RS-422ポートと直接接続可能 MIDIシーケンサー、MIDIキーボードに接続可能

2. 内部構成

音色数	ノーマル音色	トータル	1267
		XG	1074
		TG300B	614
		C/M	128 (Tr.1～9), 64 (Tr.11～16)
ドラム音色		トータル	46
		XG	36
		TG300B	10
		C/M	1
		パフォーマンス	4レイヤーまで可能、エフェクトもメモリー
		プリセット	100
		インターナル	100
		リバーブ	12
		コーラス	14
		バリエーション	70
エフェクター種類		インサーション1,2	各43
		イコライザー	4

3. ディスプレイ

LCD	カスタムLCD (バックライト付)
LED	6個 (スイッチに内蔵)

4. 操作子

[PLAY]	[UTIL]	[MODE]
[EDIT]	[EFFECT]	[EQ]
[MUTE/SOLO]	[ENTER]	[EXIT]
[PART+]	[PART-]	
[SELECT+]	[SELECT-]	
[VALUE+]	[VALUE-]	
HOST SELECT (リアパネル)		
POWERスイッチ (電源スイッチ)		
VOLUMEつまみ (マスターボリューム)		
A/D INPUT VOLUMEつまみ (インプットボリューム)		
ダイヤル		

5. 接続端子

TO HOST (MINI DIN)	
MIDI IN-A	
MIDI IN-B	
MIDI OUT	
MIDI THRU	
PHONES (ステレオ標準ジャック)	
INPUT L, R	
INDIV. OUTPUT 1, 2 (モノラル標準ジャック)	
OUTPUT L, R (ステレオ標準ジャック)	定格出力： +5db (10k $\Omega$ 負荷時) 出力インピーダンス1k $\Omega$
A/D INPUT (モノラル標準ジャック)	定格入力： (Mic) -36db 入力インピーダンス33k $\Omega$ [Mic] (Line) -11.5db 入力インピーダンス33k $\Omega$ [Line]
DC IN	
XGプラグインコネクタ (内蔵)	(2基)

6. 電源

ACアダプター (PA-5B)
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7. 外形寸法

483 (W) $\times$ 229 (D) $\times$ 44 (H) [mm]
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8. 重量

2.4Kg
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9. 付属品

取扱説明書セット
ACアダプター (PA-5B)
CD-ROM

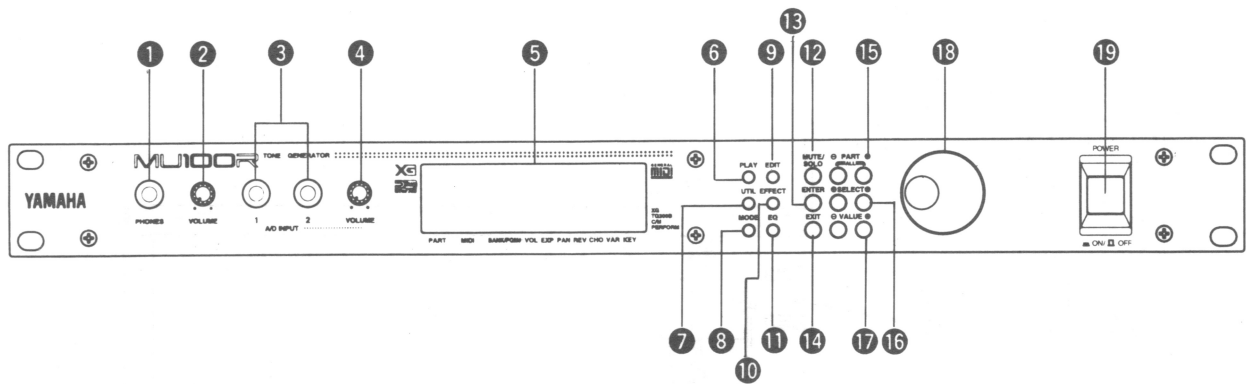
10. 出力レベル

本サービスマニュアルの "テストプログラム" の項目を参照して下さい。
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11. オプション (別売品：国内モデルのみ)

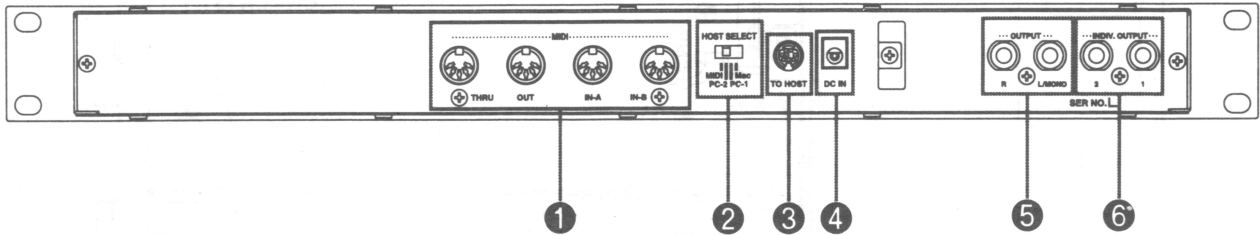
プラグインボード	ヤマハボーカルハーモニープラグインポート	PLG100-VH
	ヤマハバーチャルアコースティックプラグインボード	PLG100-VL
	ヤマハフォルマウントシンギングプラグインボード	PLG100-SG

■ PANEL LAYOUT (パネルレイアウト)



- ① PHONES jack
- ② VOLUME control
- ③ A/D INPUT 1, 2 jacks
- ④ A/D INPUT VOLUME control
- ⑤ Display
- ⑥ PLAY button
- ⑦ UTIL (UTILITY) button
- ⑧ MODE button
- ⑨ EDIT button
- ⑩ EFFECT button
- ⑪ EQ button
- ⑫ MUTE/SOLO button
- ⑬ ENTER button
- ⑭ EXIT button
- ⑮ PART  $\ominus/\oplus$  buttons
- ⑯ SELECT  $\blacktriangle/\blacktriangleright$  buttons
- ⑰ VALUE  $\ominus/\oplus$  buttons
- ⑱ DATA dial
- ⑲ POWER switch

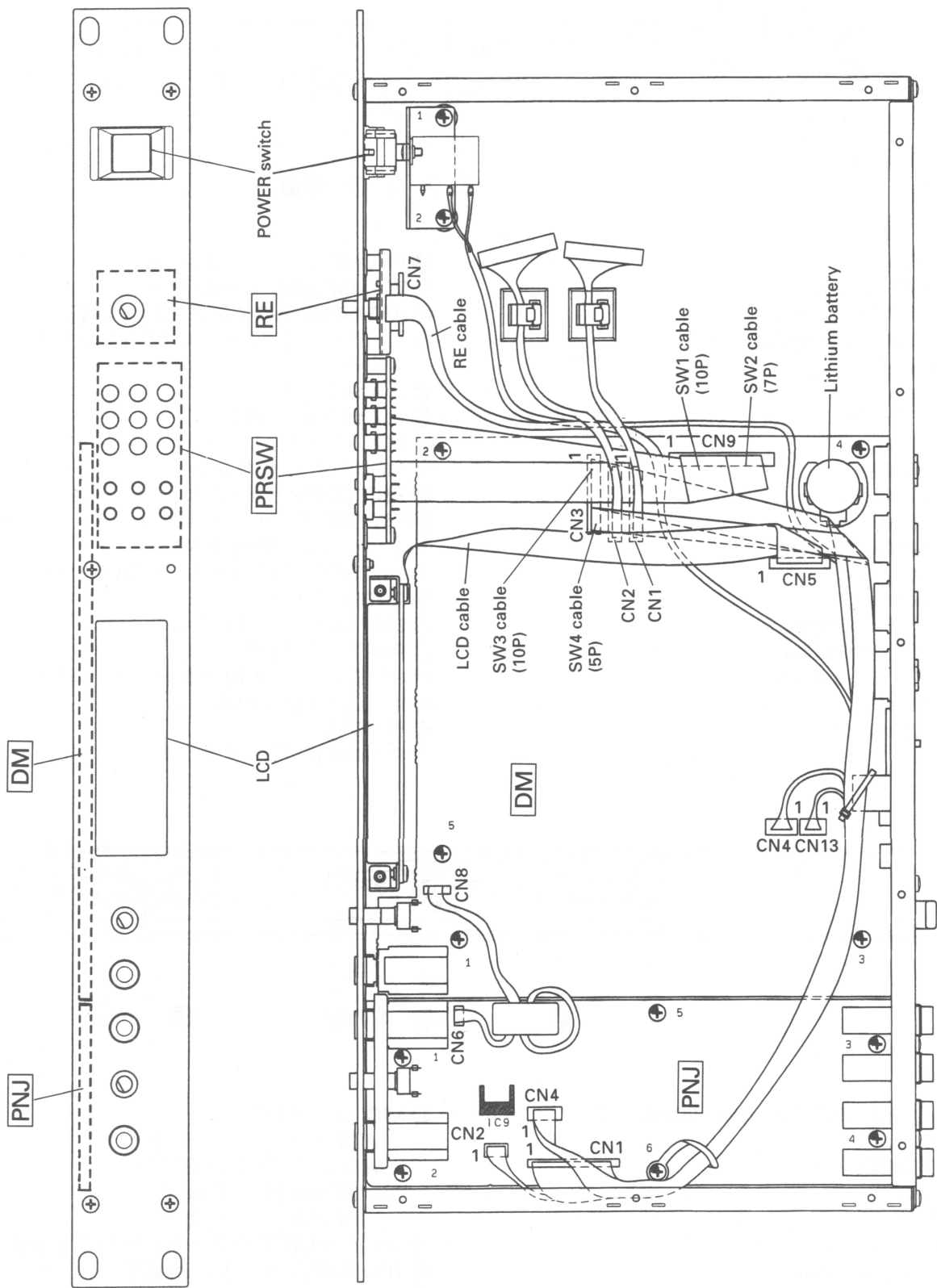
- ① PHONES (ヘッドフォン) 端子
- ② VOLUME (ボリューム) 端子
- ③ A/D INPUT (A/Dインプット) 1, 2端子
- ④ A/D INPUT VOLUME (A/Dインプットボリューム) つまみ
- ⑤ ディスプレイ
- ⑥ PLAY (プレイ) ボタン
- ⑦ UTIL (ユーティリティ) ボタン
- ⑧ MODE (モード) ボタン
- ⑨ EDIT (エディット) ボタン
- ⑩ EFFECT (エフェクト) ボタン
- ⑪ EQ (イコライザー) ボタン
- ⑫ MUTE/SOLO (ミュート/ソロ) ボタン
- ⑬ ENTER (エンター)
- ⑭ EXIT (エグジット) ボタン
- ⑮ PART (パート) ボタン
- ⑯ SELECT (セレクト) ボタン
- ⑰ VALUE (バリュー) ボタン
- ⑱ ダイアル
- ⑲ POWER (パワー) スイッチ

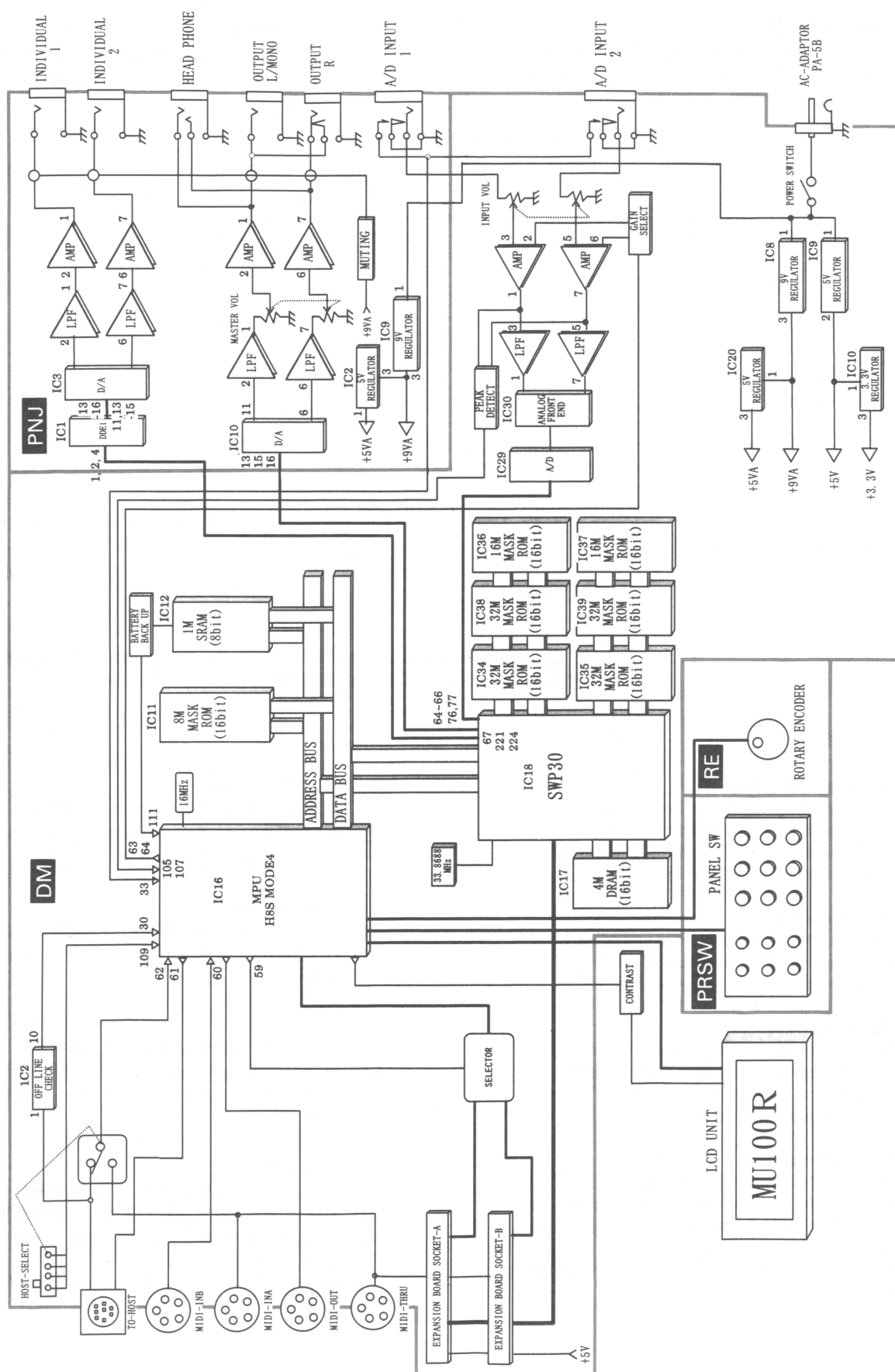


- ① MIDI THRU, MIDI OUT and MIDI IN A/B terminals
  - MIDI THRU
  - MIDI OUT
  - MIDI IN-A
  - MIDI IN-B
- ② HOST SELECT switch
- ③ TO HOST terminal
- ④ DC IN jack
- ⑤ OUTPUT R, L/MONO jacks (Right, Left+/Mono)
- ⑥ INDIV. (Individual) OUTOUT 1, 2 jacks

- ① MIDI (ミディ) 端子
  - MIDI THRU (スルー) 端子
  - MIDI OUT (アウト) 端子
  - MIDI IN-A (イン-A) 端子
  - MIDI IN-B (イン-B) 端子
- ② HOST SELECT (ホストセレクト) スイッチ
- ③ TO HOST (トゥーホスト) 端子
- ④ DC IN (ディーシーイン) 端子
- ⑤ OUTPUT (アウトプット) 端子
- ⑥ INDIV. OUTPUT (インディビデュアルアウトプット) 端子

■ CIRCUIT BOARD LAYOUT (ユニットレイアウト)



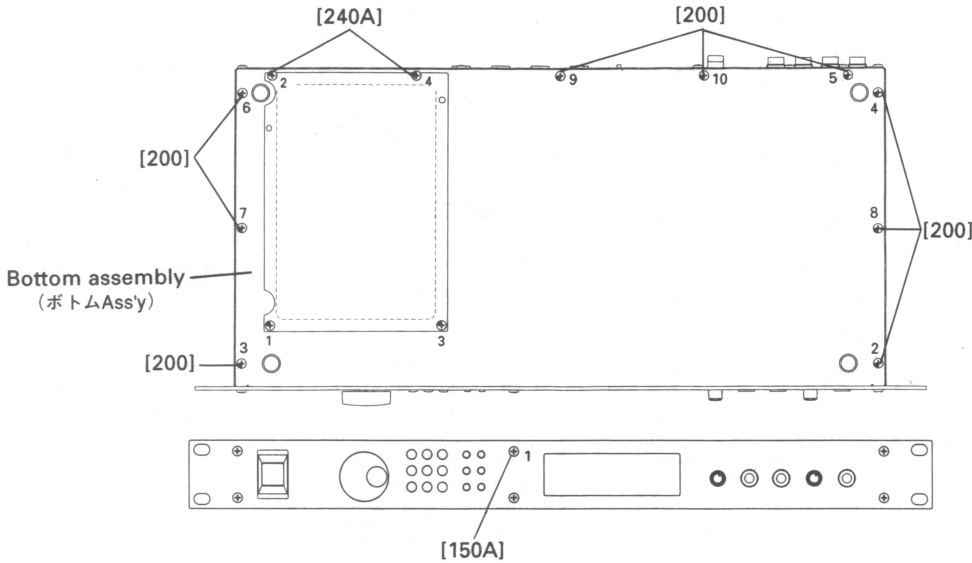


**28CA1-8811651**

■ DISASSEMBLY PROCEDURE (分解手順)

1. Bottom Assembly

- 1-1 Remove the nine (9) screws marked [200], the two (2) screws marked [240A] and the screw marked [150A]. Then the bottom assembly can be removed. (Fig. 1)



[200]: Bind Head Tapping Screw-B 3.0X6 MFZN2BL (EP600230) + バインド B タイト  
[240A]: Bind Head Screw 3.0X6 MFNI33 (EG330370) + バインド小ネジ

(Fig. 1)

2. Rear Panel Assembly

- 2-1 Remove the bottom assembly. (See procedure 1.)  
2-2 Remove the ten (10) screws marked [80A] and the two (2) screws marked [90]. Then the rear panel assembly can be removed. (Fig. 2)

3. Front Assembly

- 3-1 Remove the bottom assembly. (See procedure 1.)  
3-2 Remove the five (5) screws marked [150B]. Then the front assembly can be removed. (Fig. 2)

4. DM Circuit Board

- 4-1 Remove the bottom assembly. (See procedure 1.)  
4-2 Remove the rear panel assembly. (See procedure 2.)  
4-3 Remove the five (5) screws marked [60A]. Then the DM circuit board can be removed. (Fig. 2)

5. PNJ Circuit Board

- 5-1 Remove the bottom assembly. (See procedure 1.)  
5-2 Remove the rear panel assembly. (See procedure 2.)  
5-3 Remove the six (6) screws marked [60b]; remove the PNJ circuit board. (Fig. 2)  
\* Pull off the VOLUME knob from the PNJ circuit board.

1. ボトム Ass'y

- 1-1 [200]のネジ 9 本と、[240A]のネジ 2 本と、[150A]のネジ 1 本を外し、ボトム Ass'y を外します。(図 1)

2. リアパネル Ass'y

- 2-1 ボトム Ass'y を外します。(1 項参照)  
2-2 [80A]のネジ 10 本と[90]のネジ 2 本を外し、リアパネル Ass'y を外します。(図 2)

3. フロント Ass'y

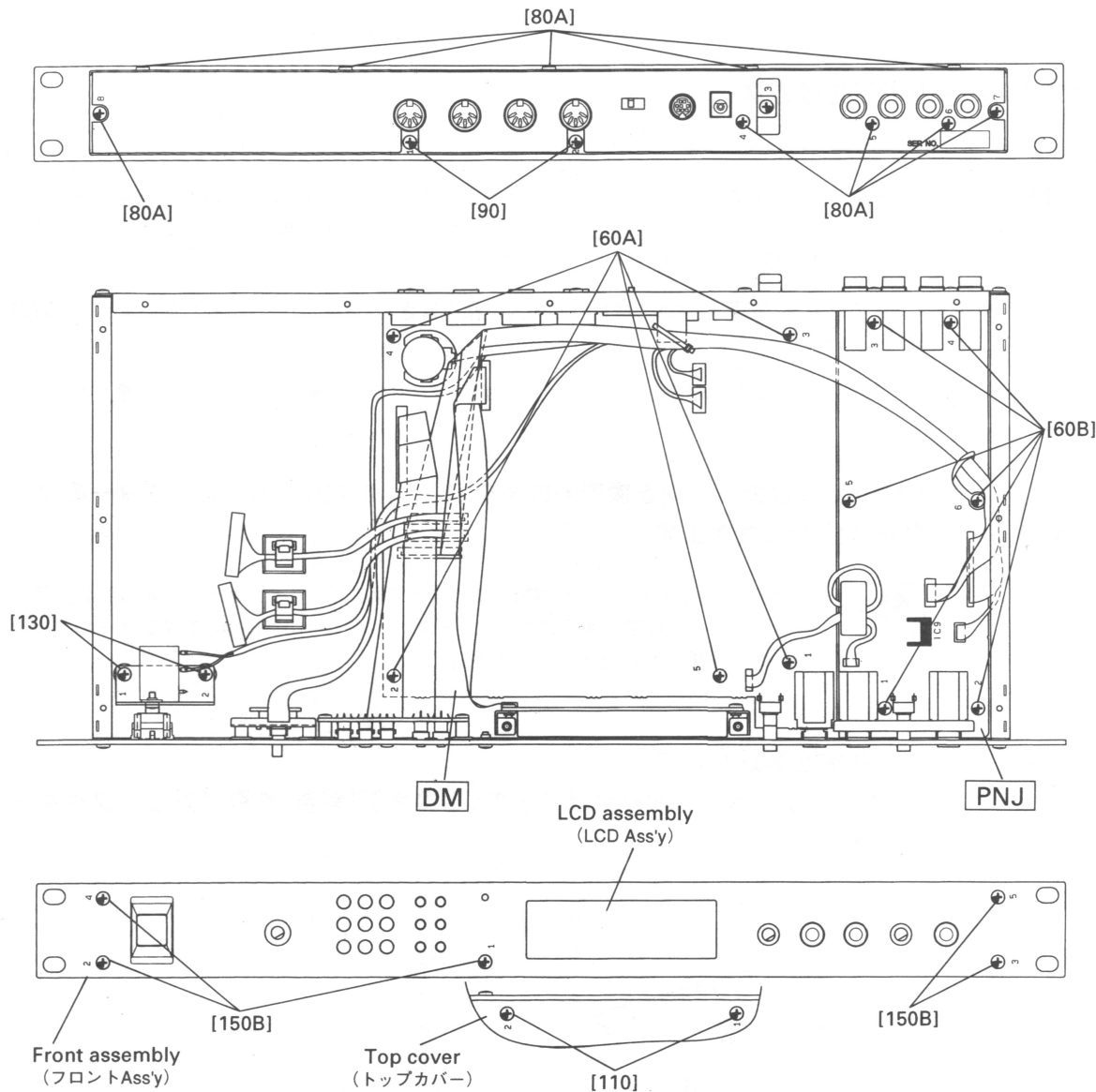
- 3-1 ボトム Ass'y を外します。(1 項参照)  
3-2 [150B]のネジ 5 本を外し、フロント Ass'y を外します。(図 2)

4. DM シート

- 4-1 ボトム Ass'y を外します。(1 項参照)  
4-2 リアパネル Ass'y を外します。(2 項参照)  
4-3 [60A]のネジ 5 本を外し、DMシートを外します。(図 2)

5. PNJ シート

- 5-1 ボトム Ass'y を外します。(1 項参照)  
5-2 リアパネル Ass'y を外します。(2 項参照)  
5-3 [60B]のネジ 6 本を外して、PNJ シートを外します。(図 2)  
\* PNJ シートからインプットツマミを引き抜きます。

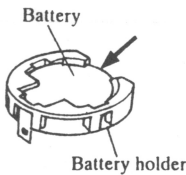


- |         |                                 |                    |             |
|---------|---------------------------------|--------------------|-------------|
| [60A]:  | Bind Head Tapping Screw-B 3.0X6 | MFZN2BL (EP600230) | + バインド B タイ |
| [60B]:  | Bind Head Tapping Screw-B 3.0X6 | MFZN2BL (EP600230) | + バインド B タイ |
| [80A]:  | Bind Head Tapping Screw-B 3.0X6 | MFZN2BL (EP600230) | + バインド B タイ |
| [90]:   | Bind Head Tapping Screw-B 3.0X8 | MFZN2BL (EP600190) | + バインド B タイ |
| [110]:  | Bind Head Tapping Screw-B 3.0X6 | MFZN2BL (EP600230) | + バインド B タイ |
| [130]:  | Bind Head Tapping Screw-B 3.0X6 | MFZN2BL (EP600230) | + バインド B タイ |
| [150B]: | Bind Head Tapping Screw-B 3.0X6 | MFZN2BL (EP600230) | + バインド B タイ |

(Fig. 2)

**Battery VN103500**  
VN103600(Battery holder for VN103500)

- Notice for back-up battery removal  
Push the battery as shown in figure,  
then the battery will pop up.
- Druk de batterij naar beneden zoals  
aangeven in de tekening, de batterij  
springt dan naar voren.



\* The lithium battery is not a part of the DM circuit board. (リチウム電池は、DM シートの構成部品ではありません。)



6. RE Circuit Board

- 6-1 Remove the bottom assembly. (See procedure 1.)
- 6-2 Remove the front assembly. (See procedure 3.)
- 6-3 After removing the the dial knob marked [220], remove the two [2] screws marked [80B]. Then the encoder assembly can be removed. (Fig. 3, Fig. 4)
- 6-4 Remove the hexagonal nut marked [A]. Then the RE circuit board can be removed from the encoder assembly.(Fig. 4)

7. PRSW Circuit Board

- 7-1 Remove the bottom assembly. (See procedure 1.)
- 7-2 Remove the front assembly. (See procedure 3.)
- 7-3 Remove the four (4) screws marked [60C].Then the PRSW circuit board can be removed. (Fig. 3)

8. Power Switch

- 8-1 Remove the bottom assembly. (See procedure 1.)
- 8-2 Remove the two (2) screws marked [130]. Then the PSW unit can be removed. (Fig. 2, Fig. 5)
- 8-3 After removing the switch knob, remove the two (2) screws marked [30]. Then the Power Switch can be removed. (Fig.5)

9. LCD Assembly

- 9-1 Remove the bottom assembly. (See procedure 1.)
- 9-2 Remove the two (2) screws marked [100]. Then the LCD assembly can be removed. (Fig. 2)

6. RE シート

- 6-1 ボトム Ass'y を外します。 (1 項参照)
- 6-2 フロント Ass'y を外します。 (3 項参照)
- 6-3 [220]のダイヤルノブを外してから、[80B]のネジ 2 本を外し、エンコーダーAss'y を外します。 (図 3、図 4)
- 6-4 [A]の六角ナットを外し、エンコーダーAss'y から RE シートを外します。 (図 4)

7. PRSW シート

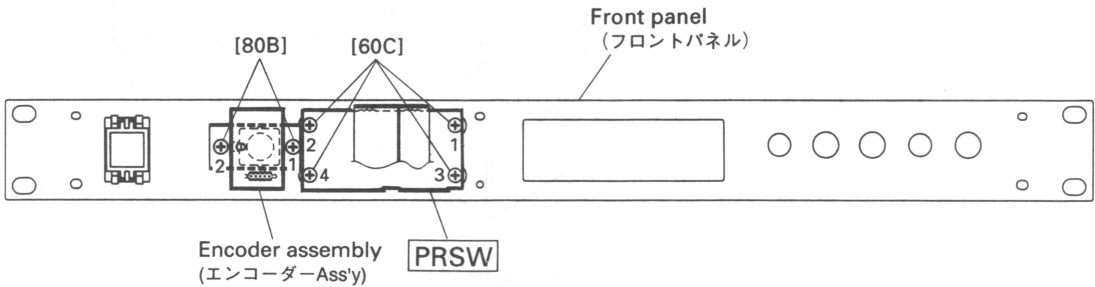
- 7-1 ボトム Ass'y を外します。 (1 項参照)
- 7-2 フロント Ass'y を外します。 (3 項参照)
- 7-3 [60C]のネジ 4 本を外し、PRSW シートを外します。 (図 3)

8. 電源スイッチ

- 8-1 ボトム Ass'y を外します。 (1 項参照)
- 8-2 [130]のネジ 2 本を外し、PSW ユニットのを外します。 (図 2、図 5)
- 8-3 スイッチノブを外してから、[30]のネジ 2 本を外し、電源スイッチを外します。 (図 5)

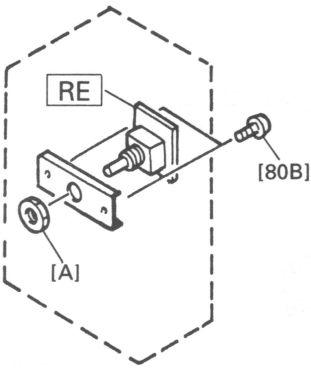
9. LCD Ass'y

- 9-1 ボトム Ass'y を外します。 (1 項参照)
- 9-2 [100]のネジ 2 本を外し、LCDAss'y を外します。 (図 2)



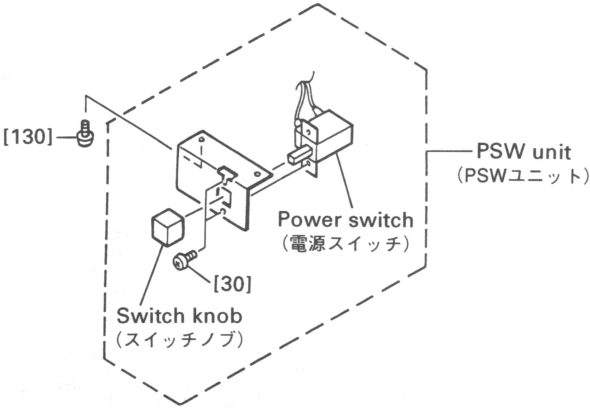
[60C]: Bind Head Tapping Screw-B 3.0X6 MFZN2BL (EP600230) + バインド B タイト  
[80B]: Bind Head Tapping Screw-B 3.0X6 MFZN2BL (EP600230) + バインド B タイト

(Fig. 3)



[80B]: Bind Head Tapping Screw-B 3.0X6 MFZN2BL (EP600230) + バインド B タイト  
[A]: This part pertains to the RE circuit board.  
(この部品は RE シートの付属部品です。)

(Fig. 4)



[30]: Bind Head Screw 3.0X6 MFZN2BL (EG330360) + バインド小ネジ  
[130]: Bind Head Tapping Screw-B 3.0X6 MFZN2BL (EP600230) + バインド B タイト

(Fig. 5)

When you reassemble these parts, you should tighten the screws in the order described in the figure.

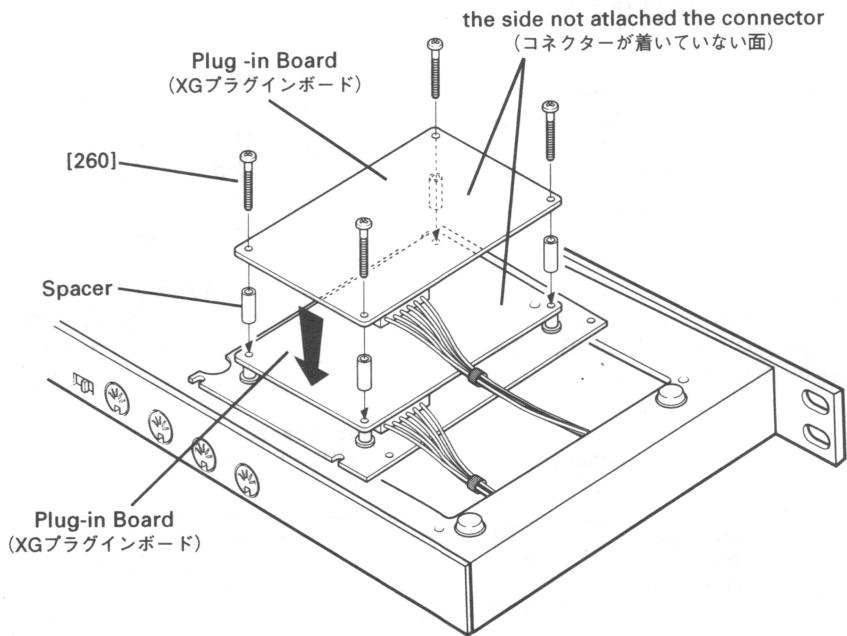
注: これらの部品を組み付けるときは、図中に示した順序でネジを締めて下さい。

10. Plug-in boards

- 10-1 Remove the two (2) screws marked [240A] and the two (2) screws marked [240B]. Then the DB cover can be removed. (Fig. 6)
- 10-2 Remove the four (4) screws marked [260]. Then the plug-in boards can be removed. (Fig. 7)

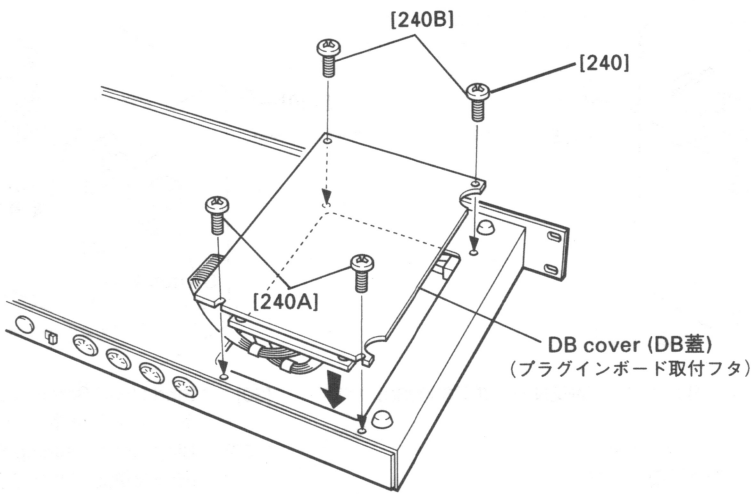
10. プラグインボード

- 10-1 [240A]のネジ2本と[240B]のネジ2本を外し、プラグインボード取り付け蓋を外します。(図6)
- 10-2 [260]のネジ4本を外し、プラグインボードを外します。(図7)
- \* 日本国内モデルでは、プラグインボードは別売のオプションでユーザー取り付けとなっています。取り付け方法については、11-14 ページを参照して下さい。



[240A]: Bind Head Screw 3.0X6 MFNI33 (EG330370) + バインド小ネジ  
[240B]: Bind Head Screw 3.0X6 MFNI33 (EG330370) + バインド小ネジ

(Fig. 6)



[260]: Bind Head Tapping Screw-C 3.0X20 MFZN2BL (VJ999700) + バインドBタイト

(Fig. 7)

## ● プラグインボードの取付け方法



- ・ XGプラグインボードの取り付け／取り外しを行うと、MU100R本体のシステムセットアップとマルチパートなどの設定は初期化されます。大切な設定はダンプアウトの操作でコンピューターやMIDIデータファイラー-MDF2などに保存してください。
- ・ XGプラグインボードの取り付け／取り外しの際、指をはさんだり、ぶついたりしないようにご注意ください。
- ・ XGプラグインボードに触れる際、ボードのとがった部分などでけがをしないようにご注意ください。



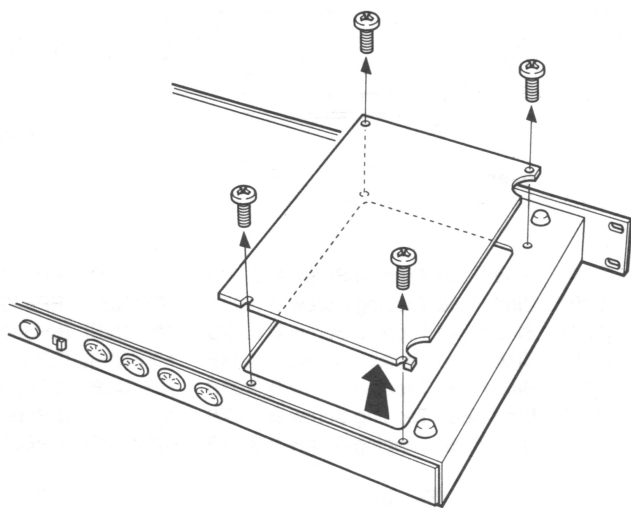
1. MU100Rに接続している機器の電源を切り、MU100RのACアダプターのプラグを本体から抜きます。



MU100RのACアダプターが接続されたままでXGプラグインボードの取り付け／取り外しを行うと、故障の原因になりますので、必ずMU100RのACアダプターのプラグを本体から抜いた状態で行ってください。

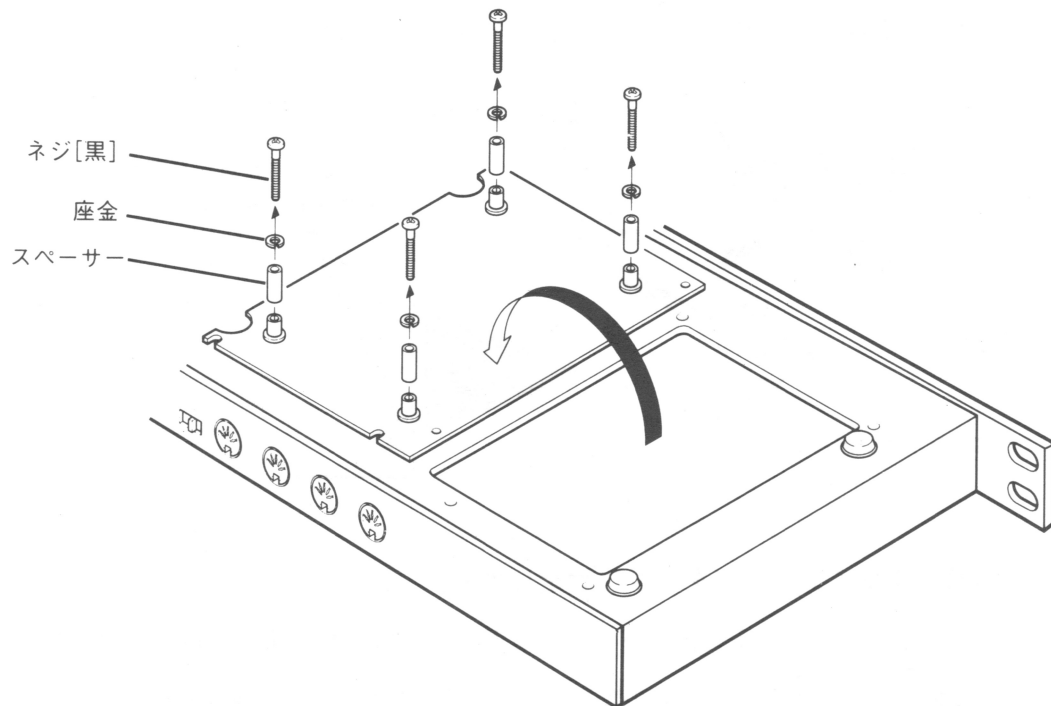
2. MU100Rを裏返します。

XGプラグインボード取り付けフタの4本のネジ[銀色]を取り外し、フタを外します。



取り付けるプラグインボードによりMIDIの送受信の状態が変わりますので、必要場合は取り付けしたボードの取扱説明書を確認して下さい。

3. あらかじめフタの裏側に取り付けられているXGプラグインボード取り付けネジ4本[黒]を取り外します。座金、スペーサーも取り外します。



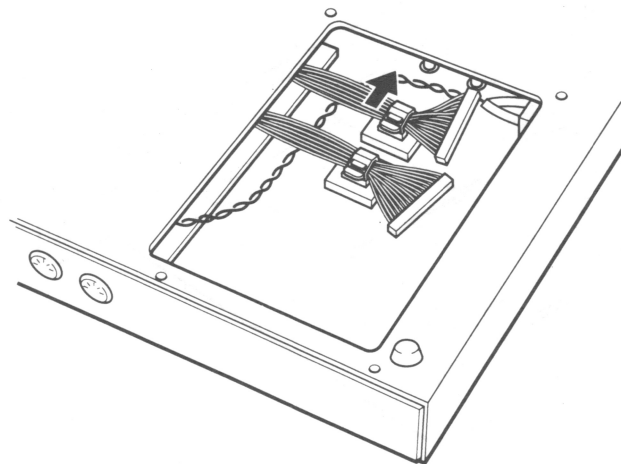
4. XGプラグインボードを静電気防止袋から取り出します。



XGプラグインボードを取り扱う前に、必ずアースされている金属の表面などに触れて、服や身体の静電気を取り除いてください。また、XGプラグインボードの取り扱い時に、基板に実装されている部品やコネクター部などに触れないようご注意ください。

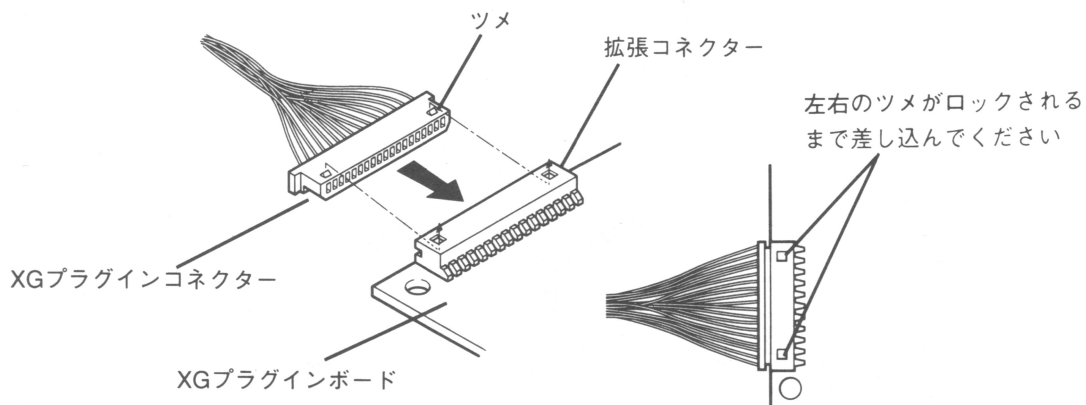
5. MU100R内のケーブルクランプを外し、拡張コネクター(どちらか1本)を引き出します。

XGプラグインボードを2枚取り付ける場合は、拡張コネクターを2本とも引き出します。なお、2本ある拡張コネクターは、それぞれ線の色が違っていますが、どちらの拡張コネクターをどちらのXGプラグインボードに差し込んでも問題ありません。



## 6. MU100Rの拡張コネクタをボードのXGプラグインコネクタに差し込みます。

この時、拡張コネクタの向きに注意し、拡張コネクタの左右のツメがロックされるまで差し込んでください(イラスト参照)。



## 7. XGプラグインボードをフタに固定します。

XGプラグインボードのICチップのある面がフタ側になるように取り付けます。

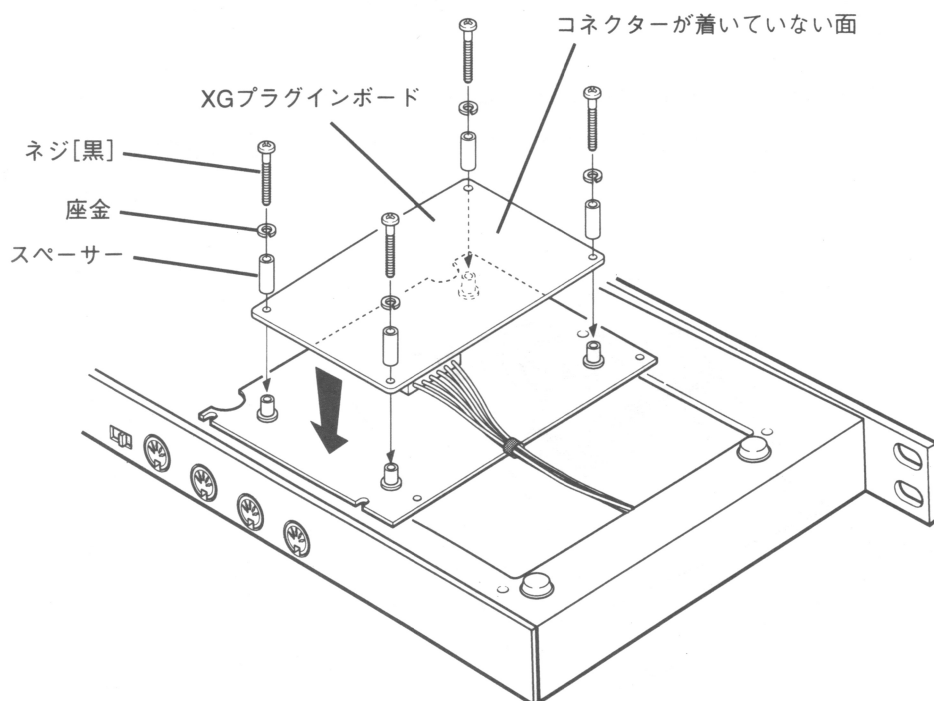


注意

XGプラグインボードの穴とフタのネジ穴の位置を合わせて真上からのせてください。穴からずれた状態でフタにのせると、ボードのチップ部品を破損する恐れがあります。

### ●XGプラグインボードを1枚取り付ける場合

手順3で外した座金4個、スペーサー4個をネジ4本[黒]に差し込んでXGプラグインボードをフタに固定します。(イラスト参照)



●XGプラグインボードを2枚取り付ける場合

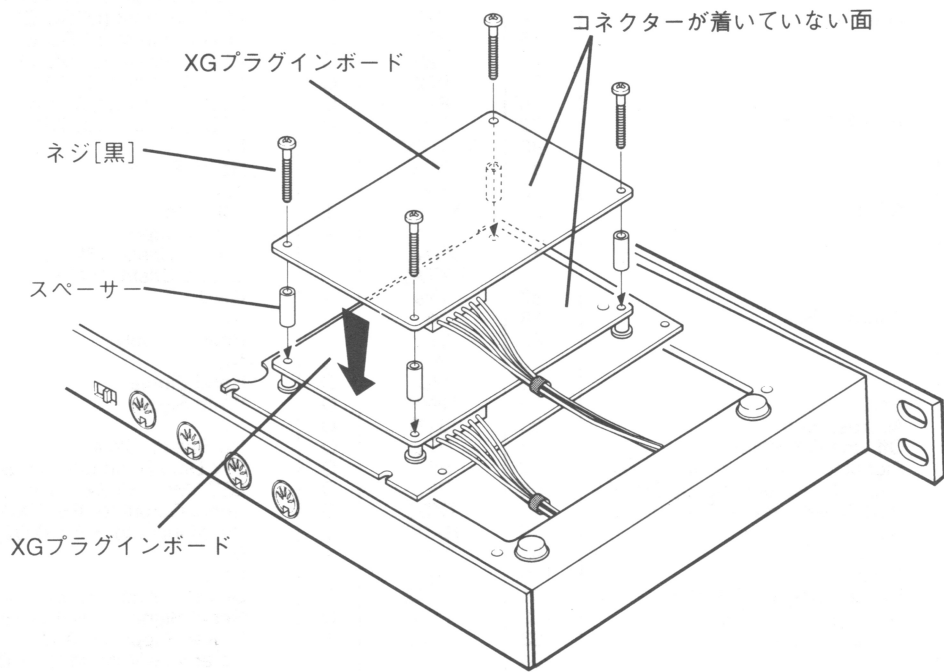
2枚のXGプラグインボードの間にスペーサーを入れ、手順3で外したネジ[黒]4本でフタに固定します。

この時、先に1ヶ所を固定してから他の3ヶ所を固定すると、作業が容易に行えます。



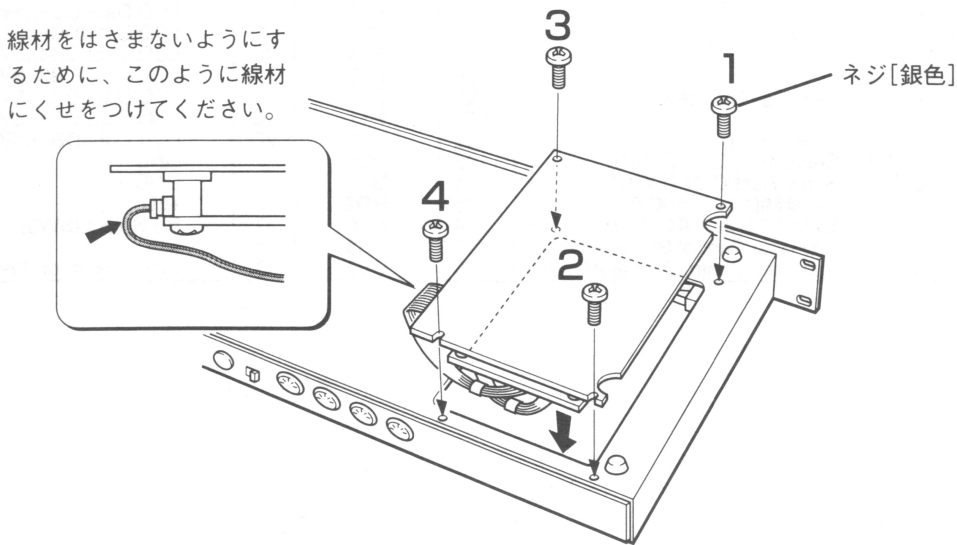
注意

2枚のXGプラグインボードを取り付ける場合は、座金を使用しないでください。



8. 手順2で外した4本のネジ[銀色]で、線材をはさまないようにして、XGプラグインボード取り付けフタを固定します。

この時、イラストに示すネジの番号順に必ずネジを締め付けてください。



LSI PIN DESCRIPTION (LSI端子機能表)

• HD6432653 (XT443A00) CPU

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	CS1	O	Chip Select for System RAM (CS1)	65	Vss	-	GND
2	CS0	O	Chip Select for System RAM (CS0)	66	P60	O	NC
3	Vss	-		67	Vss	-	GND
4	Vss	-	GND	68	Vss	-	GND
5	Vcc	-	Power Supply	69	P61	O	NC
6	A0	O	Address Bus	70	P62	O	PB Select (SW1)
7	A1	O		71	P63	O	PB Select (SW2)
8	A2	O		72	P27	O	NC
9	A3	O		73	P26	O	1 MHz Clock for Serial Interface
10	Vss	-	GND	74	P25	O	LCD Contrast (LCDC-C)
11	A4	O	Address Bus	75	P24	O	LCD Contrast (LCDC-B)
12	A5	O		76	P23	O	LCD Contrast (LCDC-A)
13	A6	O		77	P22	O	LCD Control (LCD-E)
14	A7	O		78	P21	O	LCD Control (LCD-R/W)
15	A8	O	Address Bus	79	P20	O	LCD Control (LCD-RS)
16	A9	O		80	WDT0VF	O	NC
17	A10	O		81	RES	I	Reset Signal
18	A11	O		82	NMI	I	not used
19	Vss	-	GND	83	STBV	I	not used
20	A12	O	Address Bus	84	Vcc	-	Power Supply
21	A13	O		85	XTAL	-	Quartz Cristal 16MHz
22	A14	O		86	EXTAL	-	Quartz Cristal 16MHz
23	A15	O		87	Vss	-	GND
24	A16	O	Address Bus	88	φ	-	NC
25	A17	O		89	Vcc	-	Power Supply
26	A18	O		90	AS	O	NC
27	A19	O		91	RD	O	Read Signal
28	Vss	-	GND	92	HWR	O	Write Signal
29	A20	O	Address Bus	93	LWR	O	NC
30	PA5	I	Off Line Detection	94	PF2	O	PB Select (SW4)
31	PA6	O	Signal for Rotary encoder(REB)	95	PF1	O	SW Data Read Control (SWD)
32	PA7	O	Signal for Rotary encoder(REA)	96	PF0	O	LED,SW Strobe Data Latch
33	P67	I	Plug Detection of A/D Input	97	TXD2	O	Serial Output for PB (TXD2)
34	P66	O	NC	98	RXD2	I	Serial Input for PB (RXD2)
35	Vss	-	GND	99	Vss	-	GND
36	Vss	-	GND	100	Vss	-	GND
37	P65	O	Reset Signal for SWP30	101	SCK2	O	Serial Sync Clock for PB
38	P64	O	Reset Signal for PB	102	P53	O	Reset Signal for Rotary Encoder
39	Vcc	-	Power Supply	103	AVcc	I	Power Supply for A/D
40	D0	I/O	Two Way Data Bus	104	Vref	I	Reference Voltage for A/D
41	D1	I/O		105	AN0	I	Analog Level Input R
42	D2	I/O		106	AN1	I	not used
43	D3	I/O		107	AN2	I	Analog Level Output L
44	Vss	-	GND	108	AN3	I	not used
45	D4	I/O	Two Way Data Bus	109	AN4	I	Detection of Host SW Position
46	D5	I/O		110	AN5	I	not used
47	D6	I/O		111	AN6	I	Battery Voltage Check
48	D7	I/O		112	AN7	I	ModelCheck (MU100:GND)
49	D8	I/O	Two Way Data Bus	113	AVss	-	GND
50	D9	I/O		114	Vss	-	GND
51	D10	I/O		115	P17	I/O	LCD Data(DB7),SW Data,LED6
52	D11	I/O		116	P16	I/O	LCD Data(DB6),SW Strobe Data
53	Vss	-	GND	117	P15	I/O	LCD Data(DB5),SW Strobe Data
54	D12	I/O	Two Way Data Bus	118	P14	I/O	LCD Data(DB4),SW Data,LED5
55	D13	I/O		119	P13	I/O	LCD Data(DB3),SW Data,LED4
56	D14	I/O		120	P12	I/O	LCD Data(DB2),SW Data,LED3
57	D15	I/O		121	P11	I/O	LCD Data(DB1),SW Data,LED2
58	Vcc	-	Power Supply	122	P10	I/O	LCD Data(DB0),SW Data,LED1
59	TXD0	O	Serial MIDI OUT (TXD0)	123	MD0	I	GND
60	TXD1	O	Serial Host OUT (TXD1)	124	MD1	I	GND
61	RXD0	I	Serial MIDI IN B (RXD0)	125	MD2	I	+5D
62	RXD1	I	Serial MIDI IN A (RXD1) or Host IN	126	PG0	O	PB Select (SW3)
63	P34	O	A/D Gain Control Signal(ADG1)	127	CS3	O	NC
64	P35	O	A/D Gain Control Signal(ADG2)	128	CS2	O	Chip Select for SWP30 (CS2)

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	VSS		(Ground)	121	VSS		(Ground)
2	CA0			122	HMD0	I/O	
3	CA1			123	HMD1	I/O	
4	CA2			124	HMD2	I/O	
5	CA3			125	HMD3	I/O	
6	CA4			126	HMD4	I/O	
7	CA5		Address bus of internal register	127	HMD5	I/O	
8	CA6			128	HMD6	I/O	Wave memory data bus (Upper data memory)
9	CA7			129	HMD7	I/O	
10	CA8			130	HMD8	I/O	
11	CA9			131	HMD9	I/O	
12	CA10			132	HMD10	I/O	
13	CA11			133	HMD11	I/O	
14	VSS		(Ground)	134	HMD12	I/O	
15	CD0	I/O		135	HMD13	I/O	
16	CD1	I/O		136	HMD14	I/O	
17	CD2	I/O		137	HMD15	I/O	
18	CD3	I/O		138	VSS		(Ground)
19	CD4	I/O		139	HMA0	O	
20	CD5	I/O		140	HMA1	O	
21	CD6	I/O		141	HMA2	O	
22	CD7	I/O		142	HMA3	O	
23	CD8	I/O	Data bus of internal register	143	HMA4	O	
24	CD9	I/O		144	HMA5	O	
25	CD10	I/O		145	HMA6	O	
26	CD11	I/O		146	HMA7	O	
27	CD12	I/O		147	HMA8	O	
28	CD13	I/O		148	HMA9	O	
29	CD14	I/O		149	HMA10	O	
30	VDD		(Power supply)	150	VSS		(Ground)
31	VSS		(Ground)	151	VDD		(Power supply)
32	CD15	I/O		152	HMA11	O	
33	/CS		Chip select	153	HMA12	O	Wave memory address bus (Upper 16 bits)
34	/WR		Write strobe	154	HMA13	O	
35	/RD		Read strobe	155	HMA14	O	
36	VDDS		(Power supply)	156	HMA15	O	
37	SYSH0	O		157	HMA16	O	
38	SYSH1	O		158	HMA17	O	
39	SYSH2	O		159	HMA18	O	
40	SYSH3	O	NSYS/LNSYS upper 16 bits	160	HMA19	O	
41	SYSH4	O		161	HMA20	O	
42	SYSH5	O		162	HMA21	O	
43	SYSH6	O		163	HMA22	O	
44	SYSH7	O		164	HMA23	O	
45	KONO0	O		165	HMA24	O	
46	KONO1	O	Key on data	166	VSS		(Ground)
47	KONO2	O		167	/MRAS	O	RAS when DRAM(s) is connected to wave memory
48	KONO3	O		168	/MCAS	O	CAS when DRAM(s) is connected to wave memory
49	VSS		(Ground)	169	/MOE	O	Wave memory output enable
50	SYSL0	I/O		170	/MWE	O	Wave memory write enable
51	SYSL1	I/O		171	VSS		(Ground)
52	SYSL2	I/O		172	LMD0	I/O	
53	SYSL3	I/O	NSYS input/LNSYS output lower 8 bits	173	LMD1	I/O	
54	SYSL4	I/O		174	LMD2	I/O	
55	SYSL5	I/O		175	LMD3	I/O	
56	SYSL6	I/O		176	LMD4	I/O	
57	SYSL7	I/O		177	LMD5	I/O	
58	KONI0			178	LMD6	I/O	
59	KONI1		Key on data	179	LMD7	I/O	Wave memory data bus (Lower data memory)
60	VDDS		(Power supply)	180	VDDS		(Power supply)
61	VSS		(Ground)	181	VSS		(Ground)
62	KONI2			182	LMD8	I/O	
63	KONI3			183	LMD9	I/O	
64	DAC0	O	DAC output	184	LMD10	I/O	
65	DAC1	O		185	LMD11	I/O	
66	WCLK	O	DAC0/DAC1 word clock	186	LMD12	I/O	
67	MELO0	O		187	LMD13	I/O	
68	MELO1	O		188	LMD14	I/O	
69	MELO2	O		189	LMD15	I/O	
70	MELO3	O	MEL wave data output	190	VSS		(Ground)
71	MELO4	O		191	LMA0	O	
72	MELO5	O		192	LMA1	O	
73	MELO6	O		193	LMA2	O	
74	MELO7	O		194	LMA3	O	
75	VDD		(Power supply)	195	LMA4	O	
76	ADLR	O	ADC word clock	196	LMA5	O	
77	MELI0			197	LMA6	O	
78	MELI1			198	LMA7	O	
79	MELI2		MEL wave data input	199	LMA8	O	
80	MELI3			200	LMA9	O	
81	MELI4			201	LMA10	O	
82	MELI5			202	LMA11	O	
83	MELI6			203	VSS		(Ground)
84	MELI7			204	LMA12	O	
85	VSS		(Ground)	205	LMA13	O	Wave memory address bus (Lower data memory)
86	/RCAS	O	DRAM column address strobe	206	LMA14	O	
87	RA8	O		207	LMA15	O	
88	RA7	O		208	LMA16	O	
89	RA6	O		209	LMA17	O	
90	VDD		(Power supply)	210	VDD		(Power supply)
91	VSS		(Ground)	211	VSS		(Ground)
92	RA5	O	DRAM address bus	212	LMA18	O	
93	RA4	O		213	LMA19	O	
94	RA3	O		214	LMA20	O	
95	RA2	O		215	LMA21	O	
96	RA1	O		216	LMA22	O	
97	RA0	O		217	LMA23	O	
98	/RRAS	O	DRAM row address strobe	218	LMA24	O	
99	/RWE	O	DARIM write enable	219	VSS		(Ground)
100	VSS		(Ground)	220	SYO	O	Sync. signal for master clock
101	RD7	I/O		221	SYOD	O	Sync. signal for HCLK/QCLK
102	RD6	I/O		222	QCLK	O	1/12 master clock (64Fs)
103	RD5	I/O		223	HCLK	O	1/6 master clock (128Fs)
104	RD4	I/O		224	CK256	O	1/3 master clock (256Fs)
105	RD3	I/O		225	SYSCLK	O	1/2 master clock (384Fs)
106	RD2	I/O		226	VDDS		(Power supply)
107	RD1	I/O		227	SYI	I	Sync. clock
108	RD0	I/O		228	MCLKI	I	Master clock input
109	VSS		(Ground)	229	MCLKO	O	Master clock output
110	RD17	I/O		230	VDD		(Power supply)
111	RD16	I/O	DRAM data bus	231	XIN	I	Crystal osc. input
112	RD15	I/O		232	XOUT	O	Crystal osc. output
113	RD14	I/O		233	VSS		(Ground)
114	RD13	I/O		234	/IC	I	Initial clear
115	RD12	I/O		235	CHIP2	I	2 chips mode enable
116	RD11	I/O		236	SLAVE	I	Master/Slave select when 2 chips mode
117	RD10	I/O		237	/TESTO	I	
118	RD9	I/O		238	/ACI	I	Test pin
119	RD8	I/O		239	DCTEST	I	
120	VDDS		(Power supply)	240	VDDS		(Power supply)



• **μPD63200GS (XM145A00) DAC (Digital to Analog Converter)**

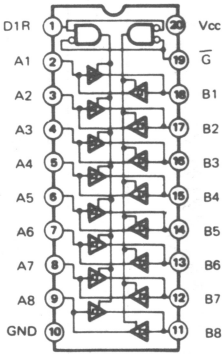
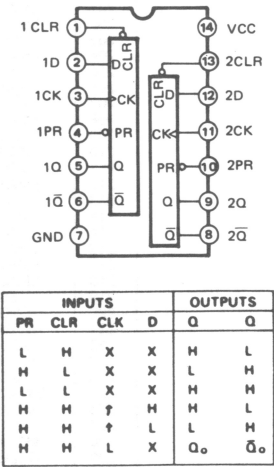
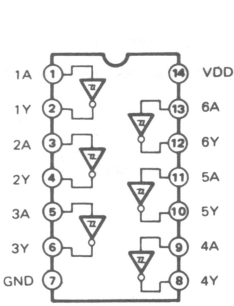
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	4/8F	I	4/8 Fs selection	9	R. REF		Channel R voltage reference
2	D. GND		Digital ground	10	L. REF		Channel L voltage reference
3	16 BIT	I	16 bit/18 bit selection	11	L. OUT	O	Channel L output
4	D. VDD		Digital power supply	12	A. GND		Analog ground
5	A. GND		Analog ground	13	WDCK	I	Word clock
6	R. OUT	O	Channel R output	14	RSI	I	Channel R series input
7	A. VDD		Analog power supply	15	SI/LSI	I	Series input/Channel L series input
8	A. VDD			16	CLK	I	Clock

• **JG710069 (XM326B00) DDE1 (DAC Dynamic Range Enhancer)**

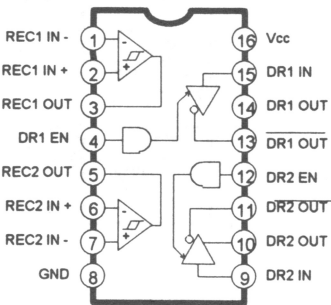
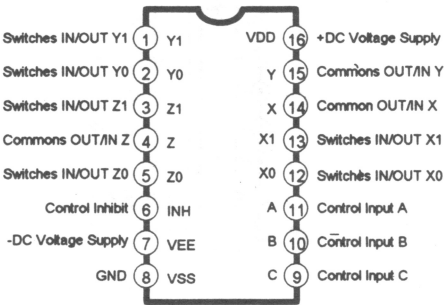
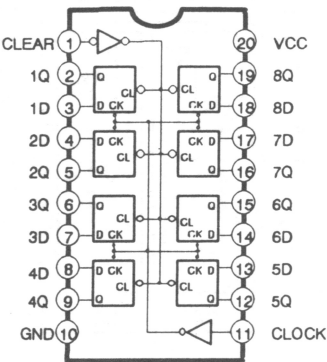
PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	CLK	I	Master clock	9	SH 0	O	N.C.
2	SYW	I	Sync signal	10	SH 1	O	N.C.
3	MIN 1	I	Signal input	11	LE	O	Latch enable for DAC
4	MIN 0	I	Signal input	12	VDD		
5	Vss			13	DACO 0	O	Output (DAC)
6	SEL 1	I	Mode select	14	DACO 1	O	Output (DAC)
7	SEL 0	I	Mode select	15	DCLK	O	Clock for DAC
8	SUP	I	1 bit shift up input	19	ICN	I	Initial clear

■ IC BLOCK DIAGRAM (ICブロック図)

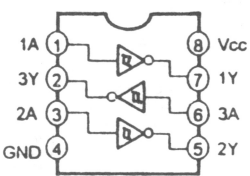
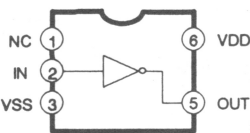
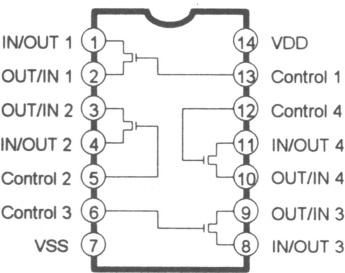
- **SN74HC14AF-TP1 (XD657A00)**  
Hex Inverter
- **SN74HC74NSR (XC726A00)**  
Dual D-Type Flip-Flop
- **TC74HC245F-T1 (XD603A00)**  
Octal 3-State Bus Transceiver



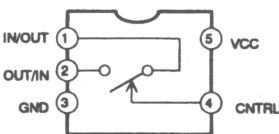
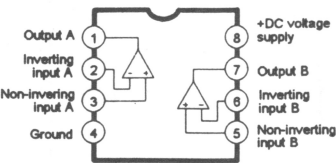
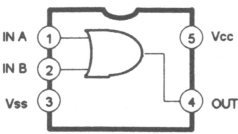
- **SN74HC273NSR** (XH223A00)  
Octal D-Type Flir Flop
- **TC74HC4051AF-TP** (XR056A00)  
Triple 2-channel Multiplexer /Demultiplexer
- **MC34051MEL** (XP881A00)  
Dual EIA-422/423 Line Transceiver



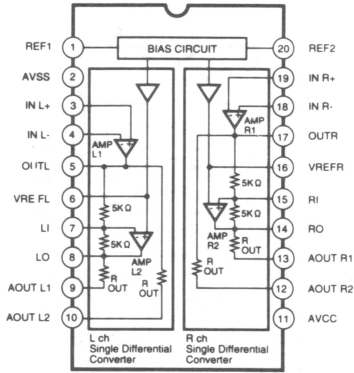
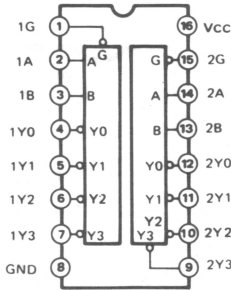
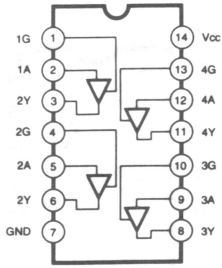
- **TC74HC4066AF-T1** (XG385A00)  
Quad Bilateral Analog Switch
- **SC7SU04FER** (XI348A00)  
Inverter
- **TC7W14F** (XR336A00)  
• **TC7W14FU** (XN883A00)  
Triple Inverter



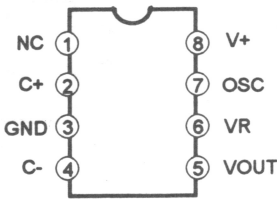
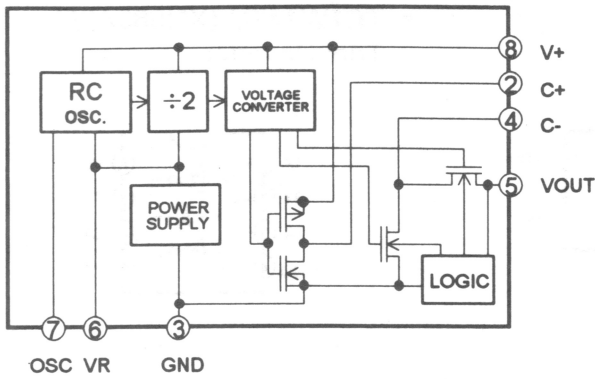
- **TC7S32F** (XM588A00)  
OR
- **μPC4570G2** (XF291A00)  
• **NJM4556AMT1** (XQ138A00)  
Dual Operational Amplifier
- **TC7S66F** (XR682A00)  
Bilateral Switch



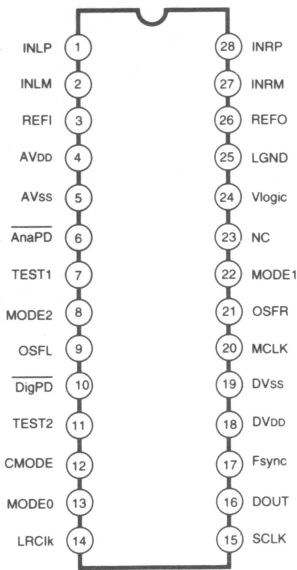
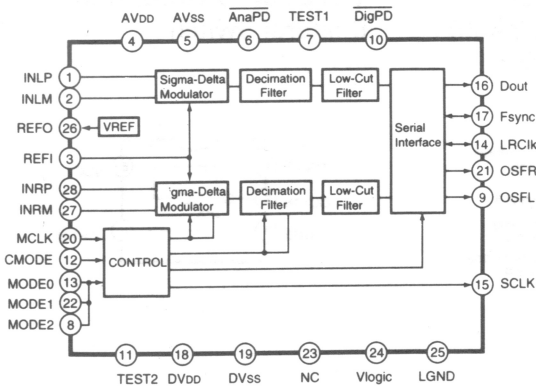
- **TC74HC126AF (XS776A00)**  
Bus Buffer
- **TC74LVC139FP (XS048A00)**  
Dual 2 to 4 Demultiplexer
- **TL32088 (XS893A00)**  
AD FRONT END



- **NJU7660M-T1 (XP596A00)**  
DC/DC Voltage Converter



- **TL320AD58C (XS892A00)**



■ TEST PROGRAM

PREPARATIONS

The following measuring instruments and jigs are necessary during the test.

- Measuring instruments:
- Audio signal generator, oscilloscope,  
Amplifier/Speaker system, etc.
- Jigs:
- MIDI cables, etc.

No.	Test	Remarks
A	TEST ENTRY	
B	PROCEEDING THROUGH THE TEST AND SELECTION WHEN AN ERROR IS DETECTED	
1	SRAM	SRAM Read/Write
2	BATTERY	A/D check on CPU
3	LCD ALL DOTS ON	
4	SWITCH & LED	SWITCH ON/OFF & LED ON/OFF
5	DIAL	Dial function
6	MIDI 1	Connect MIDI IN A to MIDI OUT
7	MIDI 2	Connect MIDI IN A to MIDI OUT
8	HOST SELECT	Slide HOST SELECT
9	TO HOST TX/RX	Factory use
10	WAVE ROM	WAVE ROM READ
11	1 kHz OUTPUT(L)	Using measuring instruments
12	1 kHz OUTPUT(R)	Using measuring instruments
13	1 kHz INDIV.OUT1	Using measuring instruments
14	1 kHz INDIV.OUT2	Using measuring instruments
15	INPUT HIGH	Using measuring instruments
16	INPUT LOW	Using measuring instruments
17	MEG&DRAM	Using measuring instruments
18	64 SOUNDS OUTPUT	By listening
19	FACTORY SETTINGS	
20	EXIT	
21	PB1 NAME	Circuit Board test of CN 1
22	PB1 RAM	Circuit Board test of CN 1
23	PB1 MIDI IN	Circuit Board test of CN 1
24	PB1 MEL	Circuit Board test of CN 1
25	PB2 NAME	Circuit Board test of CN 2
26	PB2 RAM	Circuit Board test of CN 2
27	PB2 MIDI IN	Circuit Board test of CN 2
28	PB2 MEL	Circuit Board test of CN 2

A. HOW TO ENTER THE TEST PROGRAM

While pressing the [PLAY] and the [MUTE/SOLO] buttons, turn the MU100R POWER switch on.  
When the test program is initiated, the version of the program ROM will appear on the LCD.

MU100R TEST MODE

Ver#. ## ##-##-##

(#. ##=Version number of the MU100R program ROM)

After displaying the version message shown above, the following display will appear.

01 RAM

The factory settings should be performed before any test when a circuit board or the backup battery were replaced. The factory settings are performed by turning the MU100R POWER switch on while pressing the [UTIL] and the [ENTER] buttons.

B. PROCEEDING THROUGH THE TEST

When entering the test program, the following display will appear.

01 RAM

Use the [SELECT ●] and [SELECT ●] buttons to move through the various tests of the test program.

After having selected the test, press the [ENTER] button to start the test in succession from that number.  
Pressing without selecting the test will start the test from “1. RAM” test.

TEST SELECTION WHEN AN ERROR IS DETECTED

In each test, if an NG (No Good) error is detected, press the [EXIT] button. Then the MU100R will wait for the entry of a test number.

1. SRAM TEST

01 RAM

The Write/Read check for SRAM (IC 9 and IC 10) will be performed automatically on the following address.

IC9, IC10= h'200000 ~ h'20FFFF (16-bit Data Bus)

DISPLAY OF TEST RESULTS

OK

01 RAM

ok

NG

01 RAM

err

TEST END

After displaying the test result on the LCD, the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING TROUGH THE TEST". All SRAM data is preserved.

2. BATTERY TEST

02 BATTERY

This test checks that the voltage of the battery is greater than 2.9 V and less than 3.4 V.

DISPLAY OF TEST RESULT

OK02 BATTERYok

NG02 BATTERYerr

TEST END

After displaying the test result on the LCD, the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING TROUGH THE TEST".

3. LCD-ALL DOTS "ON" TEST

Check that all dots of the LCD change to black. After checking the back light, press the [SELECT] button to control the LCD contrast in eight (8) steps.

TEST END

Press the [ENTER] button. Then the MU100R will proceed to enter the following test. If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

4. SWITCH & LED TEST

04 SWITCH & LED  
[PLAY]

Press the panel switches consecutively from the [PLAY] button to the [VALUE+] button, according to the order indicated by the LCD. At this time, check that the LED of the testing switch is lighted up.

04 SWITCH & LED  
[ENTER]

(e.g. when checking the [ENTER] switch)

The switch & LED test proceeds in the order as below.  
[PLAY] → [UTIL] → [MODE] → [EDIT] → [EFFECT] → [EQ] → [MUTE/SOLO] → [ENTER] → [EXIT] → [PART-] → [SELECT-] → [VALUE-] → [PART+] → [SELECT+] → [VALUE+]

If the switch is OK, a beep will sound and the test will proceed to the next switch. If the wrong switch is pressed, the program does not proceed and no sound will heard.

DISPLAY OF TEST RESULTS

OK04 SW & LEDOK

NAG no appearing

TEST END

When the button [VALUE] is pressed, if the test is OK, the test will be completed and proceed to the next test. If an error is detected during the test, turn the POWER off.

5. DIAL TEST

05 DIAL  
Right 0-10=00

This test checks that the dial function works properly. Press the [enter] button. Then the LCD will indicate "RIGHT 0-10=00". Rotate the dial clockwise until LCD indicates the number "10". Then the LCD will indicate "LEFT 0-10=00".

05 DIAL  
Left 0-10=00

Rotate the dial counterclockwise until the LCD indicates the number "10".

DISPLAY OF TEST RESULTS

OK05 DIALok

NG05 DIALerr

TEST END

If the test is OK, "OK" will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING TROUGH THE TEST".

6. MIDI 1 TEST

After connecting the [MIDI IN A] to the [MIDI OUT] and the [MIDI THRU] to the [MIDI IN B] via MIDI cables, execute the test. The [HOST SELECT] switch must be set at the [MIDI] during the test.

06 MIDI 1

DISPLAY OF TEST RESULTS

OK06 MIDI 1ok

NG

06 MIDI 1  
err

TEST END  
If the test is OK, “OK” will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, “PROCEEDING TROUGH THE TEST”.

7. MIDI 2 TEST

After connecting the [MIDI IN A] to the [MIDI OUT] and the [MIDI THRU] to the [MIDI IN B] via MIDI cables, execute the test. The [HOST SELECT] switch must be set at the [MIDI] during the test.

07 MIDI 2

DISPLAY OF TEST RESULTS  
OK

07 MIDI 2  
ok

NG

07 MIDI 2  
err

TEST END  
If the test is OK, “OK” will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, “PROCEEDING TROUGH THE TEST”.

8. HOST SELECT TEST

08 HOST SELECT  
Mac ZZ--YY=XX

(where ZZ : minimum value, YY : maximum value, XX : current value)

Change the [HOST SELECT] switch from [Mac] to [MIDI], according to the order indicated by the LCD.

08 HOST SELECT  
PC2 ZZ--YY=XX

(when requiring to select the [PC2])

If an unexpected code is received, the system will not proceed to the next step.  
Check that “OK” is displayed at each position of the HOST SELECT switch.

Decision value      MIDI:      0 V~0.6 V  
                         PC2:      1.25 V~2.1 V  
                         PC1:      2.8 V~3.7 V  
                         MAC:      4.7 V~5 V

DISPLAY OF TEST RESULTS  
OK

08 HOST SELECT  
ok

TEST END  
When the HOST SELECT switch is set at [MIDI], if the test is OK, the test will be completed and proceed to the next test.  
During the test, if the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.  
If NG is detected during the test, refer to section B, “PROCEEDING TROUGH THE TEST”.

9. TO HOST TX/RX TEST

09 TO HOST

This test is utilized by the factory and it is not intended for field service use.

DISPLAY OF TEST RESULT  
OK

09 TO HOST  
ok

NG

09 TO HOST  
err

TEST END  
When this test is initiated without a jig for checking, an error will occur. If an error is detected during the test, refer to section B, “PROCEEDING TROUGH THE TEST”.

10. WAVE ROM TEST

10 WAVE ROM

The Read/Verify check for the four WAVE Rooms via the SWP20-LSI will be performed automatically.

DISPLAY OF TEST RESULTS  
OK

10 WAVE ROM  
ok

NG

10 WAVE ROM  
err

TEST END  
If the test is OK, “OK” will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, “PROCEEDING TROUGH THE TEST”.

11. 1 kHz SOUND OUTPUT (L) TEST

11 OUTPUT L 1 kHz

Check that the correct signal is output from the OUTPUT (L) and the PHONES (L) jacks.

Insert the appropriate phone plug into the OUTPUT(L, R), the PHONES and the INDIV.OUTPUT (1,2) jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES output using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. If a plug is inserted to the A/D INPUT, it must be pulled out. The VOLUME control must be set at maximum for this check.

ITEMS TO BE CHECKED

- OUTPUT (L) : 1 kHz  $\pm 3$  Hz, sin wave, +2.0 dBm $\pm 2$  dB (10 k  $\Omega$  load), distortion 0.25 % or less
- OUTPUT (R) : less than -80 dBm
- PHONES (L) : 1 kHz  $\pm 3$  Hz sin wave, -4.5 dBm $\pm 2$  dB (33  $\Omega$  load), distortion 0.5 % or less
- PHONES (R) : less than -65 dBm
- INDIV.OUTPUT1: less than -80 dBm
- INDIV.OUTPUT2: less than -80 dBm

If the plug connected to the OUTPUT (R) is pulled out:  
OUTPUT (L) : -3.0 dBm $\pm 2$  dB

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

12. 1 kHz SOUND OUTPUT (R) TEST

12 OUTPUT R 1 kHz

Check that the current signal is output from the OUTPUT (R) and the PHONES (R) jacks.  
Insert the appropriate phone plug into the OUTPUT (L, R), the PHONES and the INDIV.OUTPUT (1,2) jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES output using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. If a plug is inserted to the A/D INPUT, it must be pulled out. The VOLUME control must be set at maximum for this check.

ITEMS TO BE CHECKED

- OUTPUT (L) : less than -80 dBm
- OUTPUT (R) : 1 kHz  $\pm 3$  Hz, sin wave, +2.0 dBm $\pm 2$  dB (10 k  $\Omega$  load), distortion 0.25 % or less
- PHONES (L) : less than -65 dBm
- PHONES (R) : 1 kHz  $\pm 3$  Hz sin wave, -4.5 dBm $\pm 2$  dB (33  $\Omega$  load), distortion 0.5 % or less
- INDIV.OUTPUT1: less than -80 dBm
- INDIV.OUTPUT2: less than -80 dBm

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

13. INDIV.1 1kHz SOUND OUTPUT TEST

13 INDIVOUT1 1 kHz

Check that the correct signal is output from INDIV.OUTPUT1 jack.

Insert the appropriate phone plug into the INDIV.OUTPUT (1,2) and the OUTPUT (L,R) jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the INDIV.OUTPUT1 output using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. If a plug is inserted to the A/D INPUT, it must be pulled out.

ITEMS TO BE CHECKED

- INDIV.OUTPUT1:1 kHz  $\pm 3$  Hz, sine wave, +2.0 dBm $\pm 2$  dB (10 k  $\Omega$  load), distortion 0.25 % or less)
- INDIV.OUTPUT2:less than -80 dBm
- OUTPUT (L): less than -80 dBm
- OUTPUT (R): less than -80 dBm

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

14. INDIV.2 1kHz SOUND OUTPUT TEST

14 INDIVOUT2 1 kHz

Check that the correct signal is output from INDIV.OUTPUT2 jack.

Insert the appropriate phone plug into the INDIV.OUTPUT (1,2) and the OUTPUT (L,R) jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the INDIV.OUTPUT2 output using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. If a plug is inserted to the A/D INPUT, it must be pulled out.

ITEMS TO BE CHECKED

- INDIV.OUTPUT1:1 kHz  $\pm 3$  Hz, sine wave, +2.0 dBm $\pm 2$  dB (10 k  $\Omega$  load), distortion 0.25 % or less)
- INDIV.OUTPUT2:less than -80 dBm
- OUTPUT (L): less than -80 dBm
- OUTPUT (R): less than -80 dBm

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

15. INPUT HIGH TEST

15 INPUT HIGH

Apply a signal to [A/D INPUT], and check that the signal obtained at the [OUTPUT] is controlled in gain with the A/D INPUT.

Check that the level meters on the LCD light up when the provided signal is applied to [INPUT].

Insert the appropriate phone plug into the OUTPUT (L, R) and the PHONES jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES output using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. The VOLUME control must be set at maximum for this check.

ITEMS TO BE CHECKED

Listed below are the specifications and conditions of the OUTPUT(L,R) outputs during this test.

When a sine wave signal of -36.0 dBm, 1 kHz is applied to A/D INPUT (L), and A/D INPUT is set at maximum, and A/D INPUT (R) is connected to the ground:

OUTPUT (L) : +5 dBm  $\pm$  2 dB (10 k  $\Omega$  load),  
distortion 0.5 % or less

OUTPUT (R) : less than -48 dBm

When a sine wave signal of -36.0 dBm, 1 kHz is applied to A/D INPUT (R), and A/D INPUT is set at maximum, and A/D INPUT (L) is connected to the ground:

OUTPUT (L) : less than -48 dBm

OUTPUT (R) : +5 dBm  $\pm$  2 dB (10 k  $\Omega$  load),  
distortion 0.5% or less

When a sine wave signal of -36.0 dBm, 1 kHz is applied to A/D INPUT (L), and A/D INPUT is set at minimum, and A/D INPUT (R) is connected to the ground:

OUTPUT (L) : less than -66 dBm

When a sine wave signal of -36.0 dBm, 1 kHz is applied to A/D INPUT (R), and A/D INPUT is set at minimum, and A/D INPUT (L) is connected to the ground:

OUTPUT (R) : less than -66 dBm

Check that the level meters on the LCD will light up, when the sine wave of -29.0 dBm  $\pm$  2 dB, 1 kHz is applied to the A/D INPUT (L).

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.

If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

16. INPUT LOW TEST

16 INPUT LOW

Apply a signal to [A/D INPUT], and check that the signal obtained at the [OUTPUT] is controlled in gain with the A/D INPUT.

Check that the level meters on the LCD light up when the provided signal is applied to [INPUT].

Insert the appropriate phone plug into the OUTPUT (L, R) and the PHONES jacks and check the output. If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES output using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. The VOLUME control must be set at maximum for this check.

ITEMS TO BE CHECKED

Listed below are the specifications and conditions of the OUTPUT(L,R) outputs during this test.

When a sine wave signal of -11.5 dBm, 1 kHz is applied to A/D INPUT (L), and A/D INPUT is set at maximum, and A/D INPUT (R) is connected to the ground:

OUTPUT (L) : +5 dBm  $\pm$  2 dB (10 k  $\Omega$  load),  
distortion 0.5 % or less

OUTPUT (R) : less than -60 dBm

When a sine wave signal of -11.5 dBm, 1 kHz is applied to A/D INPUT (R), and A/D INPUT is set at maximum, and A/D INPUT (L) is connected to the ground:

OUTPUT (L) : less than -60 dBm

OUTPUT (R) : +5.0 dBm  $\pm$  2 dB (10 k  $\Omega$  load),  
distortion 0.5 % or less

When a sine wave signal of -11.5 dBm, 1 kHz is applied to A/D INPUT (L), and A/D INPUT is set at minimum, and A/D INPUT (R) is connected to the ground:

OUTPUT (L) : less than -65 dBm

When a sine wave signal of -11.5 dBm, 1 kHz is applied to A/D INPUT (R), and A/D INPUT is set at minimum, and A/D INPUT (L) is connected to the ground:

OUTPUT(R) : less than -65 dBm

Check that the level meters on the LCD will light up, when the sine wave of -6.0 dBm  $\pm$  2 dB, 1 kHz is applied to the A/D INPUT (R).

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.

If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

17. MEG & DRAM

17 MEG&DRAM

Check that the correct signal is output from OUTPUT (L) jack.

Insert the appropriate phone plug into the OUTPUT (L) jack and check the output.



If necessary, verify the frequency, output waveform, output level, and THD of the OUTPUT (L,R) and the PHONES output using a frequency counter, oscilloscope, AC voltmeter(with 12.47 kHz filter) and distortion meter. The VOLUME control must be set at maximum for this check.

ITEMS TO BE CHECKED

OUTPUT(L) : 1 kHz ±3.0 Hz, sine wave, +2 dBm±2 dB  
(10 k Ω load), distortion 0.25 % or less

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

18. 64 SOUND OUTPUT TEST

18 64ch OUT

Check that the correct sine wave signals from channel 1 to channel 32 are output from the OUTPUT (L) and channel 33 through channel 64 are output from the OUTPUT (R).

If necessary, verify the output waveform using an oscilloscope (L channel: 1 kHz, R channel: 2 kHz). The VOLUME control must be set at maximum for this check. While sounding, the LCD will display the following message.

18 64ch OUT  
Lch=xx Rch=xx

(Where xx: currently sounded channel)

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

19. FACTORY SETTINGS

19 FACTORY SET

This test is used to initialize the data to the factory settings. If the [ENTER] button is pressed, the factory preset data will be restored. Then the MU100R will exit the test program mode and enter to play mode.  
If the [EXIT] button is pressed, they will not be restored.

20. EXIT

20 EXIT

When the [ENTER] button is pressed, the MU100R will exit the test program mode and enter to the play mode. To remain in the test program, press the [EXIT] button. Then the MU100R will wait for the entry of the test number.  
Check that the noise levels are as follows, after the MU100R has quit the test program.

OUTPUT (L) : -88 dBm 以下  
OUTPUT (R) : -88 dBm 以下  
PHONES (L) : -88 dBm 以下  
PHONES (R) : -88 dBm 以下

21. PB1 NAME TEST

21 PB1 NAME

After transmitting the request of the circuit board name and version, the MU100R receives the data through the MU-PB wires and the CN1 connector, and displays it on the LCD. Check the circuit board name and version on the LCD.

DISPLAY OF TEST RESULTS

OK 

21 PB1 NAME  
PLG100-VL VX.XX

  
(X.XX: version number)

NG 

21 PB1 NAME  
err

(When not receiving the data from Plug-in Board)

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

22. PB1 RAM TEST

22 PB1 RAM

Check that the circuit board RAM, which is connected to connector CN1, functions correctly.

DISPLAY OF TEST RESULTS

OK 

22 PB1 RAM  
ok

NG 

22 PB1 RAM  
err

TEST END

If the test is OK, “OK” will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, “PROCEEDING TROUGH THE TEST”.

23. PB1 MIDI IN TEST

23 PB1 MIDI IN

Check that the MIDI IN, which is connected to the connector CN1, functions correctly.

After connecting the MIDI IN A jack to the MIDI OUT jack via MIDI, execute the test. At this time the HOST SELECT switch should be set at MIDI.

DISPLAY OF TEST RESULTS

OK

23 PB1 MIDI IN  
ok

NG

23 PB1 MIDI IN  
err

TEST END

If the test is OK, “OK” will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, “PROCEEDING TROUGH THE TEST”.

24. PB1 MEL

24 PB1 MEL

Check that the CN1-MEL IN/OUT functions correctly and the correct signal is output from the OUTPUT (L,R).

A signal is input from the AD input, goes through the DM circuit board and output from the CN1-MEL OUT. The signal travels from the CN1-MEL OUT to the circuit board connected to the CN1 connector, and the tone generator of the circuit board translates the signal into a 1 kHz sine wave. This sine wave travels through the MEL OUT and CN1-MEL IN, then is output as sound. If the effect circuit board is connected to the CN1 connector, the signal is not translated and the same signal as it received is returned to the DM circuit board through the MEL OUT and CN1-MEL IN, then is output as sound.

Insert the appropriate phone plug into the OUTPUT(L,R) and check the output.

The VOLUME control must be set at maximum for this test.

ITEMS TO BE CHECKED

- OUTPUT(L):1 kHz ± 3 Hz, 4.0 dBm ± 2 dBm (VH)  
1 kHz ± 3 Hz, 3.2 dBm ± 2 dBm (VL)
- OUTPUT(R):1 kHz ± 3 Hz, 4.0 dBm ± 2 dBm (VH)  
1 kHz ± 3 Hz, 3.2 dBm ± 2 dBm (VL)

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

25. PB2 NAME

25 PB2 NAME

After transmitting the request of the circuit board name and version, the MU100R receives the data through the MU-PB wires and the CN1 connector, and displays it on the LCD. Check the circuit board name and version on the LCD.

DISPLAY OF TEST RESULTS

OK

25 PB2 NAME  
PLG100-VL VX. XX  
(X. XX: version number)

NG

25 PB2 NAME  
err

(When not receiving the data from Plug-in Board)

TEST END

Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.  
If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

26. PB2 RAM

26 PB2 RAM

Check that the circuit board RAM which is connected to connector CN2 functions correctly.

DISPLAY OF TEST RESULTS

OK

26 PB2 RAM  
ok

NG

26 PB2 RAM  
err

TEST END

If the test is OK, “OK” will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, “PROCEEDING TROUGH THE TEST”.

27. PB2 MIDI IN

27 PB2 MIDI IN

Check that the MIDI IN, which is connected to the connector CN2, functions correctly.

After connecting the MIDI IN A jack to the MIDI OUT jack via MIDI, execute the test. At this time the HOST SELECT switch should be set at MIDI.

## DISPLAY OF TEST RESULTS

OK	27 PB2 MIDI IN ok
----	----------------------

NG	27 PB2 MIDI IN
	err

TEST END

If the test is OK, "OK" will be displayed on the LCD and the test will be completed and proceed to the next test. If an error is detected during the test, refer to section B, "PROCEEDING TROUGH THE TEST".

## 28. PB2 MEL

28 PB2 MEL

Check that the CN2-MEL IN/OUT functions correctly and the correct signal is output from the OUTPUT (L,R).

A signal is input from the AD input, goes through the DM circuit board and output from the CN2-MEL OUT. The signal travels from the CN2-MEL OUT to the circuit board connected to the CN2 connector, and the tone generator of the circuit board translates the signal into a 1 kHz sine wave. This sine wave travels through the MEL OUT and CN2-MEL IN, then is output as sound. If the effect circuit board is connected to the CN2 connector, the signal is not translated and the same signal as it received is returned to the DM circuit board through the MEL OUT and CN2-MEL IN, then is output as sound.

Insert the appropriate phone plug into the OUTPUT(L,R) and check the output.

The VOLUME control must be set at maximum for this test.

## ITEMS TO BE CHECKED

OUTPUT(L):1 kHz  $\pm$  3 Hz, 4.0 dBm  $\pm$  2 dBm (VH)

1 kHz  $\pm$  3 Hz, 3.2 dBm  $\pm$  2 dBm (VL)

OUTPUT(R):1 kHz  $\pm$ 3 Hz, 4.0 dBm  $\pm$ 2 dBm (VH)

 $1 \text{ kHz} \pm 3 \text{ Hz}, 3.2 \text{ dBm} \pm 2 \text{ dBm (VL)}$ 

TEST END

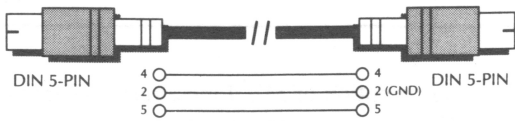
Press the [ENTER] button. Then the MU100R will automatically proceed to the next test.

If the [EXIT] button is pressed, the MU100R will wait for the entry of the test number.

MIDI/COMPUTER CONNECTING CABLES

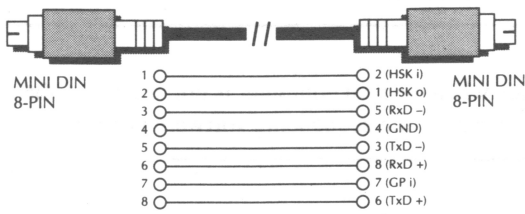
MIDI

Standard MIDI cable. Maximum length 15 meters.



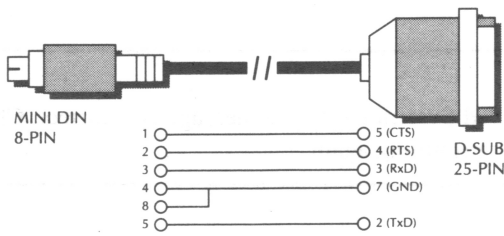
Mac

Apple Macintosh Peripheral cable (M0197). Maximum length 2 meters.



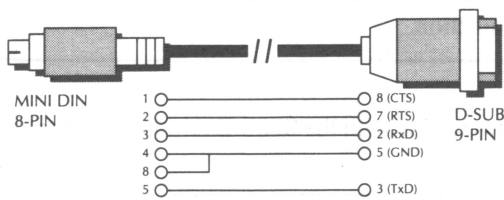
PC-1

8-pin MINI DIN to D-SUB 25-pin cable. If your PC-1 type computer has a 9-pin serial port, use the PC-2 type cable. Maximum length 1.8 meters.



PC-2

8-pin MINI DIN to D-SUB 9-pin cable. Maximum length 1.8 meters.



■ **ERROR MESSAGES**

**Battery Low!**

The battery voltage (for internal memory backup) may be too low. Bring the unit to your local Yamaha dealer or any other authorized Yamaha service personnel.

---

**Illegal Data!**

A data error resulted during reception of MIDI messages. Try transmitting the data again, or turn the MU100R off and back on again.

---

**MIDI Buffer Full!**

Too much MIDI data is being received by the MU100R at one time. Reduce the amount of data being sent to the MU100R.

---

**HOST is OffLine!**

This message appears when the host computer is not turned on, the connecting cable is not properly connected, or the sequencing software is not active.

---

**SysEx Adrs ERROR!**

The data of the received System Exclusive message is incorrect. Check the address of the message and try transmitting again.

---

**SysEx Data ERROR!**

The data of the received System Exclusive message is incorrect. Check the data of the message (as to whether it requires an MSB or LSB header) and try transmitting again.

---

**SysEx Size ERROR!**

The data of the received System Exclusive message is incorrect. Check the size of the message and try transmitting again.

---

**Check Sum ERROR!**

The checksum of the received System Exclusive message is incorrect. Check the checksum of the message and try transmitting again.

---

**This Parameter isn't Excl Data**

The selected parameter has no System Exclusive value and cannot be displayed with the Show Exclusive function.

---

**No Parameter**

The selected parameter for use with the Show Exclusive function does not exist as a valid parameter.

---

**Rcv CH is OFF!**

The selected parameter for use with the Show Exclusive function cannot be converted to a MIDI message value since the Receive Channel for the Part is off. Set the Receive Channel to an appropriate value.

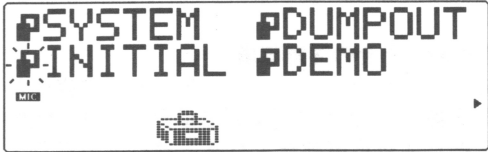
# INITIALIZE

The Initialize functions allow you to restore the factory settings of the MU100R.

**NOTE**  
Since the Initialize functions replace existing data, you should save any and all important settings to a MIDI data storage device before using these functions.

Operation

- 1 Press the **UTIL** button and select “INITIAL,” then press the **ENTER** button.



- 2 From the Initialize menu, select the type of data to be initialized: Factory Settings (FactSet), selected Sound Module mode (XGInit, GM Init, C/MInit, PFMInit) or Drum (DrumInit). Then, press the **ENTER** button to call up the selected data dump.



Factory Settings (FactSet)



This restores the original factory settings of the MU90R.

Selected Sound Module Mode:

Extended General MIDI (XGInit)



General MIDI (GM Init)



Computer Music (C/MInit)



Performance (PFMInit)



One of the four parameters above will be available, depending on the currently selected Sound Module mode: XG, TG300B, C/M or PFM. Initializing this parameter restores the original settings for the selected mode.

**NOTES**  
● For the PFMInit setting, only the currently selected Performance will be initialized.  
● For XGInit and GM Init, the initialized settings are the same as when the MU90R is reset upon receiving an XG System On or GM System On message.

Drum (DrumInit)



**Range:** DrumS1 — DrumS4  
This restores the original drum settings for the selected Drum Setup S1 — S4. (Use the **VALUE**  $\ominus/\oplus$  buttons or data dial to select the desired Drum Setup.)

**NOTE**  
This parameter is not available when the MU90R is set to Performance mode.

- 3 From the “Are you sure?” prompt, press the **ENTER** button to execute the operation, or press the **EXIT** button to cancel it and return to the previous display.

An “Executing...” message appears in the display during the operation. When the operation is completed, the MU90R returns to the Initialize menu.

■ テストプログラム

準備

測定条件: 本体をテストする場合は、次の測定器・治具が必要です。

測定器: 低周波発振器、アナログ波形測定機、キーボードアンプなど

治具: MIDI ケーブル、HOST チェック治具など

テスト 番号	表題	判定条件など
A	テストエントリー	
B	テストの進め方および NG のときのテストの進め方	
1	SRAM	SRAM READ/WRITE
2	BATTERY	CPU の A/D チェック
3	LCD ドットとコントラスト	全白、全黒の反転
4	スイッチと LED	スイッチ ON/OFF、LED ON/OFF
5	DIAL	ダイヤルのチェック
6	MIDI 1	MIDI IN A と MIDI OUT を接続します
7	MIDI 2	MIDI IN B と MIDI OUT を接続します
8	HOST SELECT	HOST SELECT スイッチを切り替えます
9	TO HOST TX/RX	HOST チェック治具を接続します
10	WAVE ROM	WAVE ROM READ
11	1 kHz OUTPUT(L) 発音	計測
12	1 kHz OUTPUT(R) 発音	計測
13	1 kHz Indiv.OUT1 発音	計測
14	1 kHz Indiv.OUT2 発音	計測
15	INPUT HIGH	計測
16	INPUT LOW	計測
17	MEG&DRAM	計測
18	64 音発音	聴感
19	ファクトリーセット	
20	EXIT	
21	PB1 NAME	Slot1 の PB テスト
22	PB1 RAM	Slot1 の PB テスト
23	PB1 MIDI IN	Slot1 の PB テスト
24	PB1 MEL	Slot1 の PB テスト
25	PB2 NAME	Slot2 の PB テスト
26	PB2 RAM	Slot2 の PB テスト
27	PB2 MIDI IN	Slot2 の PB テスト
28	PB2 MEL	Slot2 の PB テスト

21～24 のテストを行う場合は、電源を立ち上げる前に MU100R の CN1 に PB を接続して下さい。

25～28 のテストを行う場合は、電源を立ち上げる前に MU100R の CN2 に PB を接続して下さい。

以下のテストは MU100R 本体の検査としては、行う必要はありません。

- 22 PB1 RAM
- 26 PB2 RAM

A. テストエントリー

[PLAY] ボタンと [MUTE/SOLO] ボタンを押しながら、MU100 の電源を ON します。

MU100 TEST MODE

Ver#. ## #-###-##

しばらくすると、以下の表示がされます。

01 RAM

Ver#.###は、製品プログラム ROM のバージョン番号です。

テストを進めるときの注意事項

組み立て上がり直後、またはバッテリー交換直後からテストを始めるときは、[UTIL] ボタンと [ENTER] ボタンを押しながら電源を入れることによってファクトリーセットを行い、その後でテストを実行して下さい。

B. テストの進め方

テストにエントリーすると、次の画面が表示されます。

01 RAM

SELECT キーによりテスト番号を選択し、[ENTER] を押すと、押されたテスト番号から順に自動的にテストが実行されます。  
何も選択せずに [ENTER] を押すと、"01 RAM" より、テストナンバー順に自動的にテストが実行されます。  
エラーが発生した場合は、エラー表示を行ってテストは止まります。

NG と判断したときのテストの進め方

各テストにおいて NG と判断した場合は、[EXIT] を押すと、テスト番号の選択画面となります。  
ただし、"04 SW & LED" のテスト中にエラーが発生した場合は、電源を切ってテストを終了して下さい。

1. SRAM

01 RAM

次の SRAM 領域に、データ "A5" をライト／リードしてベリファイチェックを行います。  
IC9, IC10= h'200000 ～ h'20FFFF (16-bit Data Bus)

判定結果の表示

OK

01 RAM

ok

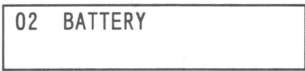
NG

01 RAM

err

**テストの終了方法**  
OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、  
“B. テストの進め方”を参照して下さい。  
また、SRAM のすべてのデータは保存されます。

2. BATTERY



バッテリー電圧が、CPU(IC 11)の A/D によりチェックされた内容が、2.9 V～3.4 V の範囲にあることを確認します。

判定結果の表示



**テストの終了方法**  
OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、  
“B. テストの進め方”を参照して下さい。

3. LCD ドットブリンクとコントラスト

LCD の全ドットが、白から黒に反転することを目で見て確認します。  
また、バックライトが正しく点灯していることを確認したら、[SELECT]キーを押して、コントラストが8段階に切り替わることを確認します。

**テストの終了方法**  
[ENTER]を押すとテストは終了し、次のテストへ進みます。  
[EXIT]を押すとテストは終了し、テスト番号の選択画面となります。

4. スイッチと LED



[PLAY]から[VALUE+]までのパネルスイッチを以下のような LCD の表示に従って ON/OFF します。  
このとき、LCD に表示されているスイッチの LED が点灯していることを確認した後、スイッチを押してスイッチが正常に動作することを確認します。



([ENTER]スイッチのチェックの場合)

スイッチ チェックの順序を以下に示します。  
[PLAY]→[UTIL]→[MODE]→[EDIT]→[EFFECT]→  
[EQ]→[MUTE/SOLO]→[ENTER]→[EXIT]→[PART-]  
→[SELECT-]→[VALUE-]→[PART+]→[SELECT+]→  
[VALUE+]

LCD の表示に従ってスイッチを ON/OFF したとき、  
スイッチが正常の場合"ポーッ"と発音して次のス  
イッチにテストが進みます。  
NG の場合、LCD に指示されたスイッチを押しても、  
次のスイッチのテストに進みません。

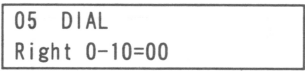
判定結果の表示



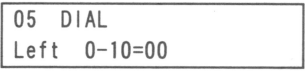
NG      なし

**テストの終了方法**  
[VALUE+]までのチェックすると、次のテストに進み  
ます。  
テスト途中で NG と判断した場合は、一度電源を  
切ってテストをやり直して下さい。

5. DIAL



ダイヤルが正しく動作することを確認します。LCD の  
表示に従って値が 10 になるまでダイヤルをゆっくり  
右に回します。値が 10 になると次の表示になります。



LCD の表示に従って値が 10 になるまでダイヤルを  
ゆっくり右に回します。

判定結果の表示



**テストの終了方法**  
OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、  
“B. テストの進め方”を参照して下さい。

6. MIDI 1

MIDI IN A 端子と MIDI OUT 端子、そして MIDI  
THRU 端子と MIDI IN B 端子を MIDI ケーブルで接続  
した後、テストを実行します。このとき、HOST  
SELECT は MIDI にセットしておきます。



06 MIDI 1

MIDI OUT 端子からテストパターン(AA 50 5F)を送って MIDI IN A 端子で受信した結果で判定します。

判定結果の表示

OK

06 MIDI 1  
ok

NG

06 MIDI 1  
err

テストの終了方法

OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、“B. テストの進め方”を参照して下さい。

7. MIDI 2

MIDI IN A 端子と MIDI OUT 端子、そして MIDI THRU 端子と MIDI IN B 端子を MIDI ケーブルで接続した後、テストを実行します。  
このとき、HOST SELECT は MIDI にセットしておきます。

07 MIDI 2

MIDI OUT 端子からテストパターン(AA 50 5F)を送って MIDI IN A 端子で受信し、MIDI THRU 端子から出力されデータを MIDI IN B 端子で受信した結果で判定します。

判定結果の表示

OK

07 MIDI 2  
ok

NG

07 MIDI 2  
err

テストの終了方法

OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、“B. テストの進め方”を参照して下さい。

8. HOST SELECT

08 HOST SELECT  
Mac ZZ--YY=XX

(ZZ = 下限値、YY = 上限値、XX = 測定値)

LCD の表示に従って、[Mac]から[PC-1]→[PC-2]→[MIDI]の順に HOST SELECT スイッチを切り替え、スイッチが正しく働くことを確認します。

08 HOST SELECT  
PC2 ZZ--YY=XX

(\*[PC2]に切り替え要求中)

正しい DATA が来るまでは無限ループとなります。

判定値 MIDI: 0 V～0.6 V  
PC2: 1.25 V～2.1 V  
PC1: 2.8 V～3.7 V  
MAC: 4.7 V～5 V

LCD の表示に従ってスイッチを切り替えたとき、全て OK となることを確認します。

判定結果の表示

OK

08 HOST SELECT  
ok

テストの終了方法

[MIDI]までチェックすると OK が表示され、テストは次に進みます。テストの途中で[EXIT]を押すと、テストを終了してテスト番号の選択画面となります。  
テスト途中で、NG と判断した場合の処理方法は、“B. テストの進め方”を参照して下さい。

9. TO HOST TX/RX

09 TO HOST

このテストは、工場出荷検査用のテストです。ここでは、実行しません。  
このテストは、TO HOST IN/OUT の動作確認をテストパターン(AA 50 5F)により行います。

判定結果の表示

OK

09 TO HOST  
ok

NG

09 TO HOST  
err

テストの終了方法

テスト用の治具なしでテストを実行すると、エラーが発生します。処理方法は、“B. テストの進め方”を参照して下さい。

10. WAVE ROM

10 WAVE ROM

SWP20 を介して 4 つの WAVE ROM のデータをリード／ベリファイします。

判定結果の表示

OK

10 WAVE ROM  
ok

NG

10 WAVE ROMerr

テストの終了方法  
OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、  
“B. テストの進め方” を参照して下さい。

11. 1 kHz OUTPUT (L)発音

11 OUTPUT L 1 kHz

OUTPUT(L)端子および PHONES(L)端子より、正常な信号が出力されていることを確認します。  
OUTPUT(L, R) 端子、PHONES(L, R) 端子、  
INDIV.OUTPUT(1,2)端子にプラグを差し込み、各出力の周波数、出力波形、出力レベルを観測・測定します。このとき、A/D INPUT には、プラグが差し込まれていないこと。  
また、マスターボリュームは MAX とします。

チェック項目  
OUTPUT(L)： 1 kHz ±3 Hz、SIN 波、+2.0 dBm±2 dB  
(負荷 10 k Ω)、歪率 0.25 %以下  
OUTPUT(R)： -80 dBm 以下  
PHONES(L)： 1 kHz ±3 Hz、SIN 波、-4.5 dBm±2 dB  
(負荷 33 Ω)、歪率 0.5 %以下  
PHONES(R)： -65 dBm 以下  
INDIV.OUTPUT1： -80 dBm 以下  
INDIV.OUTPUT2： -80 dBm 以下

OUTPUT (R)のプラグを抜いたとき  
OUTPUT(L)： -3.0 dBm±2 dB

テストの終了方法  
[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

12. 1 kHz OUTPUT (R)発音

12 OUTPUT R 1 kHz

OUTPUT(R)端子および PHONES(R)端子より、正常な信号が出力されていることを確認します。  
OUTPUT(L, R) 端子、PHONES(L, R) 端子、  
INDIV.OUTPUT(1,2)端子にプラグを差し込み、各出力の周波数、出力波形、出力レベルを観測・測定します。このとき、A/D INPUT には、プラグが差し込まれていないこと。  
また、マスターボリュームは MAX とします。

チェック項目  
OUTPUT(L)： -80 dBm 以下  
OUTPUT(R)： 1 kHz ±3 Hz、SIN 波、+2.0 dBm±2 dB  
(負荷 10 k Ω)、歪率 0.25 %以下

PHONES(L)： -65 dBm 以下  
PHONES(R)： 1 kHz ±3 Hz、SIN 波、-4.5 dBm±2 dB  
(負荷 33 Ω)、歪率 0.5 %以下  
INDIV.OUTPUT1： -80 dBm 以下  
INDIV.OUTPUT2： -80 dBm 以下

テストの終了方法  
[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

13. 1kHz Indiv. OUT1 発音

13 INDIVOUT1 1 kHz

INDIV.OUTPUT1 端子より、正常な信号が出力されていることを確認します。  
INDIV.OUTPUT(1,2)端子と OUTPUT(L, R)端子にプラグを差し込み、各出力の周波数、出力波形、出力レベルを観測・測定します。

チェック項目  
INDIV.OUTPUT1:1 kHz ±3 Hz、SIN 波、+2.0 dBm±2 dB  
(負荷 10 k Ω)、歪率 0.25 %以下  
INDIV.OUTPUT2:-80 dBm 以下  
OUTPUT L: -80 dBm 以下  
OUTPUT R: -80 dBm 以下

テストの終了方法  
[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

14. 1kHz Indiv. OUT2 発音

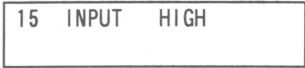
14 INDIVOUT2 1 kHz

INDIV.OUTPUT2 端子より、正常な信号が出力されていることを確認します。  
INDIV.OUTPUT(1,2)端子と OUTPUT(L, R)端子にプラグを差し込み、各出力の周波数、出力波形、出力レベルを観測・測定します。

チェック項目  
INDIV.OUTPUT1:-80 dBm 以下  
INDIV.OUTPUT2:1 kHz ±3 Hz、SIN 波、+2.0 dBm±2 dB  
(負荷 10 k Ω)、歪率 0.25 %以下  
OUTPUT L: -80 dBm 以下  
OUTPUT R: -80 dBm 以下

テストの終了方法  
[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

15. INPUT HIGH



INPUT GAIN が HIGH のときに、A/D INPUT 端子に入力した信号が、INPUT VOLUME によりゲインが変化し、OUTPUT 端子より出力されることを確認します。また、規定のレベルの信号を A/D INPUT 端子に入力することにより、LCD のレベルメータが点灯することを確認します。

OUTPUT(L, R)端子と PHONES(L, R)端子共にプラグを差し込み、各出力の周波数、出力波形、出力レベルを観測・測定します。

このとき、マスターボリュームは MAX とします。

チェック項目

A/D INPUT(L)端子に-36.0 dBm、1 kHz の SIN 波を入力（A/D INPUT(R)端子はグラウンドに接続）し、INPUT VOLUME を MAX としたとき

OUTPUT(L)： +5 dBm±2 dB（負荷 10k Ω）、歪率 0.5 %以下

OUTPUT(R)： -48 dBm 以下

A/D INPUT(R)端子に-36.0 dBm、1 kHz の SIN 波を入力（A/D INPUT(L)端子はグラウンドに接続）し、INPUT VOLUME を MAX としたとき

OUTPUT(L)： -48 dBm 以下

OUTPUT(R)： +5 dBm±2 dB（負荷 10 k Ω）、歪率 0.5% 以下

A/D INPUT(L)端子に-36.0 dBm、1 kHz の SIN 波を入力（A/D INPUT(R)端子はグラウンドに接続）し、INPUT VOLUME を MIN としたとき

OUTPUT(L)： -66 dBm 以下

A/D INPUT(R)端子に-36.0 dBm、1 kHz の SIN 波を入力（A/D INPUT(L)端子はグラウンドに接続）し、INPUT VOLUME を MIN としたとき

OUTPUT(R)： -66 dBm 以下

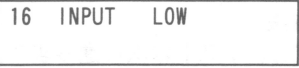
INPUT VOLUME を MAX とし、A/D INPUT(L)端子に-29.0 dBm±2 dB、1 kHz の SIN 波を入力したとき、LCD のレベルメータが点灯することを確認します。

テストの終了方法

[ENTER]を押すと、テストは次に進みます。

[EXIT]を押すと、テスト番号の選択画面となります。

16. INPUT LOW



INPUT GAIN が LOW のときに、A/D INPUT 端子に入力した信号が、INPUT VOLUME によりゲインが変化し、OUTPUT 端子より出力されることを確認します。また、規定のレベルの信号を A/D INPUT 端子

に入力することにより、LCD のレベルメータが点灯することを確認します。

OUTPUT(L, R)端子と PHONES(L, R)端子共にプラグを差し込み、各出力の周波数、出力波形、出力レベルを観測・測定します。

このとき、マスターボリュームは MAX とします。

チェック項目

A/D INPUT(L)端子に-11.5 dBm、1 kHz の SIN 波を入力（A/D INPUT(R)端子はグラウンドに接続）し、INPUT VOLUME を MAX としたとき

OUTPUT(L)： +5 dBm±2 dB（負荷 10k Ω）、歪率 0.5 %以下

OUTPUT(R)： -60 dBm 以下

A/D INPUT(R)端子に-11.5 dBm、1 kHz の SIN 波を入力（A/D INPUT(L)端子はグラウンドに接続）し、INPUT VOLUME を MAX としたとき

OUTPUT(L)： -60 dBm 以下

OUTPUT(R)： +5.0 dBm±2 dB（負荷 10 k Ω）、歪率 0.5% 以下

A/D INPUT(L)端子に-11.5 dBm、1 kHz の SIN 波を入力（A/D INPUT(R)端子はグラウンドに接続）し、INPUT VOLUME を MIN としたとき

OUTPUT(L)： -65 dBm 以下

A/D INPUT(R)端子に-11.5 dBm、1 kHz の SIN 波を入力（A/D INPUT(L)端子はグラウンドに接続）し、INPUT VOLUME を MIN としたとき

OUTPUT(R)： -65 dBm 以下

INPUT VOLUME を MAX とし、A/D INPUT(R)端子に-6.0 dBm±2 dB、1 kHz の SIN 波を入力したとき、LCD のレベルメータが全て点灯することを確認します。

テストの終了方法

[ENTER]を押すと、テストは次に進みます。

[EXIT]を押すと、テスト番号の選択画面となります。

17. MEG と DRAM



OUTPUT(L)端子から出力される信号の周波数、出力波形、出力レベルを観測・測定し、正常な信号が出力されていることを確認します。このとき、A/D INPUT には、プラグが差し込まれていないこと。

また、マスターボリュームは MAX とします。

なお、最低でも 2 秒以上は観測して下さい。

チェック項目

OUTPUT(L)： 1 kHz ±3.0 Hz、SIN 波、+2 dBm±2 dB（負荷 10 k Ω）、歪率 0.25 %以下

テストの終了方法

[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

18. 64 音発音

18 64ch OUT
-------------

OUTPUT(L)端子からは、1 チャンネルから 32 チャンネルまでの信号が発音されます。また、OUTPUT(R)端子からは、33 チャンネルから 64 チャンネルまでの信号が発音されます。

発音時間は約 0.3 秒、間隔が約 0.1 秒で 32 回繰り返し発音されますので、聴感で 64 の発音チャンネルが正常に発音されていることを確認します。  
また、出力波形が正常なサイン波であることを確認します。(Lch = 1 kHz、Rch = 2 kHz)  
このとき、マスターボリュームは MAX とします。  
テスト中、LCD には以下のように表示されます。

18 64ch OUT
Lch=xx Rch=xx

(xx：現在発音中のチャンネルナンバー)

テストの終了方法

[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

19. ファクトリーセット

19 FACTORY SET
----------------

[ENTER]を押すと各データはファクトリーセットされて工場出荷データとなり、テストモードから抜けます。  
[EXIT]を押すと、ファクトリーセットは実行されず EXIT します。

20. EXIT

20 EXIT
---------

[ENTER]を押すと、テストモードから抜けて、プレイモードになります。  
[EXIT]を押すと、テスト番号の選択画面となります。

テストモードを抜けプレイモードになったとき、ノイズレベルが次の条件を満たすことを確認して下さい。

OUTPUT(L)： -88 dBm 以下  
OUTPUT(R)： -88 dBm 以下  
PHONES(L)： -88 dBm 以下  
PHONES(R)： -88 dBm 以下

21. PB1 NAME

21 PB1 NAME
-------------

MU-PB 間通信用信号線を使い、MU から PB にボードネームとバージョンのリクエストを出し、PB からその情報を得て、LCD に表示します。CN1 の通信用信号線が正しく動作していることの確認、ボードネームとバージョンの確認を行います。  
本テストを行う場合は、本体電源を入れる前に本体 CN1 に PB を接続しておいて下さい。

判定結果の表示

OK 

21 PB1 NAME
PLG100-VL VX.XX

  
(X.XX = バージョンナンバー)

NG 

21 PB1 NAME
err

  
(PB から情報が返って来ない場合)

テストの終了方法

[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

22. PB1 RAM

22 PB1 RAM
------------

MU100 の CN1 に接続された PB の RAM チェックを行います。

本テストを行う場合は、本体電源を入れる前に本体 CN1 に PB を接続しておいて下さい。

判定結果の表示

OK 

22 PB1 RAM
ok

NG 

22 PB1 RAM
err

テストの終了方法

OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、“B. テストの進め方”を参照して下さい。

23. PB1 MIDI IN

23 PB1 MIDI IN

MU100 の CN1 に接続された PB の MIDI IN のチェックを行います。

MIDI IN A 端子と MIDI OUT 端子を MIDI ケーブルで接続した後、テストを実行します。このとき、HOST SELECT は MIDI にセットしておきます。

本テストを行う場合は、本体電源を入れる前に本体 CN1 に PB を接続しておいて下さい。

判定結果の表示

OK

23 PB1 MIDI IN  
ok

NG

23 PB1 MIDI IN  
err

テストの終了方法

OK のときは、OK が表示されて次のテストに進みます。テスト途中で、NG と判断した場合の処理方法は、“B. テストの進め方”を参照して下さい。

24. PB1 MEL

24 PB1 MEL

OUTPUT(L,R)より正常な信号が出力されていること（下記3テスト）を確認します。  
（内容）

MU100RのCN1-MEL OUT からAD INPUTに入力された信号を出力し、PBに発音を要求します。音源PBは1kHz Sin 波をMEL OUT から出力します。エフェクトPBは入力された信号をMEL OUTから出力します。MU100R は CN1-MEL IN に入力された Sin 波を OUTPUTから出力します。

1. MU100R本体のテスト  
CN1のMEL IN/OUTが正しく動作していることを確認します。
2. 音源PBのテスト(PLG100-VL,SG)  
音源部及び、MEL OUTが正しく動作していることを確認します。
3. エフェクトPBのテスト(PLG100-VH)  
エフェクト部及び、MEL IN/OUTが正しく動作していることを確認します。

OUTOUT(L,R) にプラグを差し込み、各出力の周波数、出力波形、出力レベルを観測して下さい。

ボリュームはMAXとします。

本テストを行う場合は、本体電源を入れる前に本体 CN1 に PB を接続しておいて下さい。

チェック項目

OUTPUT(L):1 kHz ±3 Hz, 4.0dBm ±2 dBm (PLG100-VH)  
1 kHz ±3 Hz, 3.2dBm ±2 dBm (PLG100-VL)  
1 kHz ±3 Hz, 2.0dBm ±2 dBm (PLG100-VS)  
OUTPUT(R):1 kHz ±3 Hz, 4.0dBm ±2 dBm (PLG100-VH)  
1 kHz ±3 Hz, 3.2dBm ±2 dBm (PLG100-VL)  
1 kHz ±3 Hz, 2.0dBm ±2 dBm (PLG100-VS)

[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

その他

MU100R 本体のテストを行う場合は PLG100-VH を使用して下さい。

25. PB2 NAME

25 PB2 NAME

MU-PB 間通信用信号線を使い、MU から PB にボードネームとバージョンのリクエストを出し、PB からその情報を得て、LCD に表示します。CN2 の通信用信号線が正しく動作していることの確認、ボードネームとバージョンの確認を行います。  
本テストを行う場合は、本体電源を入れる前に本体 CN2 に PB を接続しておいて下さい。

判定結果の表示

OK

25 PB2 NAME  
PLG100-VL VX. XX  
(X. XX = バージョンナンバー)

NG

25 PB2 NAME  
err  
(PB から情報が返って来ない場合)

テストの終了方法

[ENTER]を押すと、テストは次に進みます。  
[EXIT]を押すと、テスト番号の選択画面となります。

26. PB2 RAM

26 PB2 RAM

MU100R の CN2 に接続された PB の RAM チェックを行います。

本テストを行う場合は、本体電源を入れる前に本体 CN2 に PB を接続しておいて下さい。

判定結果の表示

OK 26 PB2 RAM ok

NG 26 PB2 RAM err

テストの終了方法

OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、  
“B. テストの進め方” を参照して下さい。

27. PB2 MIDI IN

27 PB2 MIDI IN

MU100R の CN2 に接続された PB の MIDI IN の  
チェックを行います。

MIDI IN A 端子と MIDI OUT 端子を MIDI ケーブルで  
接続した後、テストを実行します。このとき、HOST  
SELECT は MIDI にセットしておきます。

本テストを行う場合は、本体電源を入れる前に本体  
CN2 に PB を接続しておいて下さい。

判定結果の表示

OK 27 PB2 MIDI IN ok

NG 27 PB2 MIDI IN err

テストの終了方法

OK のときは、OK が表示されて次のテストに進みます。  
テスト途中で、NG と判断した場合の処理方法は、  
“B. テストの進め方” を参照して下さい。

28. PB2 MEL

28 PB2 MEL

OUTPUT(L,R)より正常な信号が出力されていること  
(下記3テスト)を確認します。  
(内容)

MU100RのCN2-MEL OUT からAD INPUTに入力され  
た信号を出力し、PBに発音を要求します。音源PBは  
1kHz Sin 波をMEL OUT から出力します。エフェク  
トPBは入力された信号をMEL OUTから出力します。  
MU100R は CN2-MEL IN に入力された Sin 波 を  
OUTPUTから出力します。

1. MU100R本体のテスト

CN2のMEL IN/OUTが正しく動作していることを確認  
します。

2. 音源PBのテスト(PLG100-VL,SG)

音源部及び、MEL OUTが正しく動作していることを  
確認します。

3. エフェクトPBのテスト(PLG100-VH)

エフェクト部及び、MEL IN/OUTが正しく動作して  
いることを確認します。

OUTOUT(L,R) にプラグを差し込み、各出力の周波数、  
出力波形、出力レベルを観測して下さい。

ボリュームはMAXとします。

本テストを行う場合は、本体電源を入れる前に本体  
CN1 に PB を接続しておいて下さい。

チェック項目

OUTPUT(L):1 kHz  $\pm$  3 Hz, 4.0dBm  $\pm$  2 dBm (PLG100-VH)  
1 kHz  $\pm$  3 Hz, 3.2dBm  $\pm$  2 dBm (PLG100-VL)  
1 kHz  $\pm$  3 Hz, 2.0dBm  $\pm$  2 dBm (PLG100-VS)

[ENTER]を押すと、テストは次に進みます。

[EXIT]を押すと、テスト番号の選択画面となります。

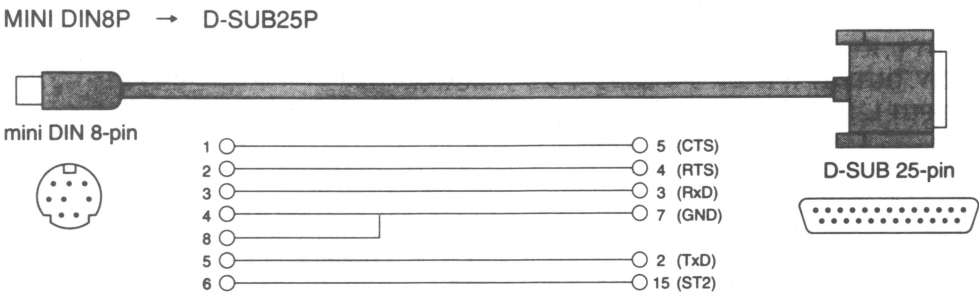
その他

MU100R 本体のテストを行う場合は PLG100-VH を使  
用して下さい。

■ ケーブル配線図

NEC PC-9800/9821シリーズとの接続

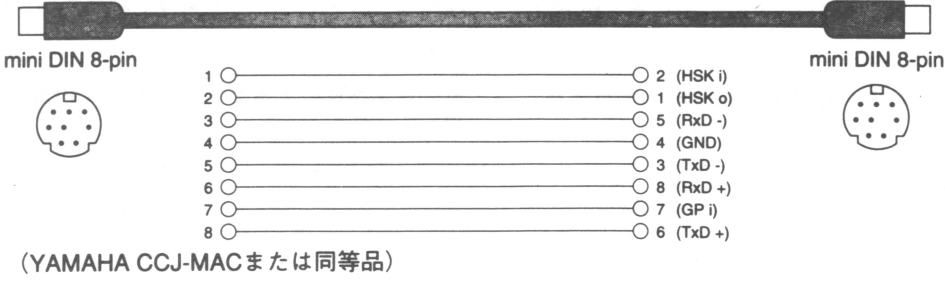
mini DIN 8-pin → D-SUB 25-pin (YAMAHA CCJ-PC1、CCJ-PC1NFまたは同等品)



Apple Macintoshシリーズとの接続

システムペリフェラル - 8 ケーブル (YAMAHA CCJ-MAC または同等品)

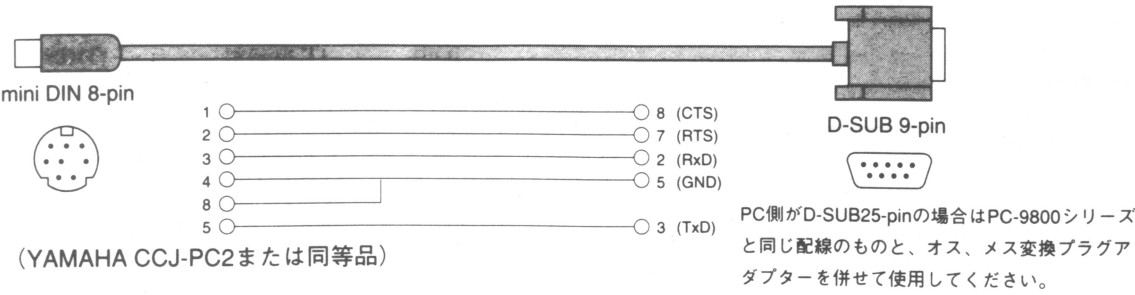
Apple社システムペリフェラル - 8 ケーブル「M0197」



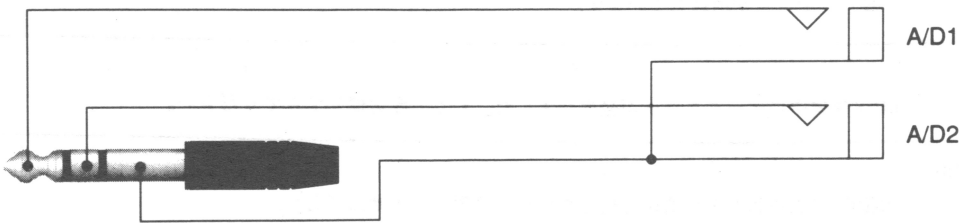
IBM PC/ATシリーズとの接続

mini DIN 8-pin → D-SUB 9-pin (YAMAHA CCJ-PC2 または同等品)

MINI DIN8P → D-SUB9P



モノラル×2→ステレオプラグ配線図



各プラグのピン番号(オモテから見たピン番号)

mini DIN 8-pin



D-SUB 25-pin



D-SUB 9-pin



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その他、本書に記載されている会社名および商品名等は、各社の登録商標および商標です。



■ エラーメッセージ

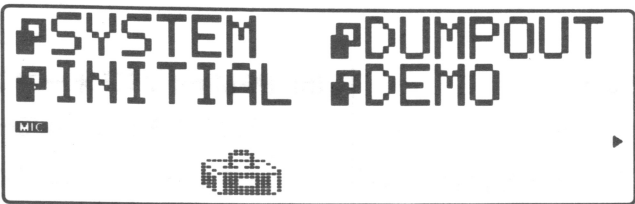
Battery Low!	内蔵バッテリーが消耗しています。
Illegal Data!	MIDI受信中にデータエラーが発生しました。もう一度送信してみてください。
MIDI Buffer Full!	大量のMIDI情報を短時間に受信したため、処理できませんでした。 不要なMIDI情報はなるべく送らないようにしてください。
HOST is OffLine!	コンピューターの電源が切れているか、ケーブルが正しく接続されていません。 ケーブルを確認して、コンピューター側のドライバーやMIDIアプリケーションが正しく機能しているか確認してください。
SysEx Adrs ERROR!	受信したシステムエクスクルーシブメッセージのアドレスが違います。 送信データのアドレスを確認してください。
SysEx Data ERROR!	受信したシステムエクスクルーシブメッセージのデータが違います。 送信データの内容(MSB、LSBが必要なデータかなど)を確認してください。
SysEx Size ERROR!	受信したシステムエクスクルーシブメッセージのサイズが違います。 送信データのサイズを確認してください。
Check Sum ERROR!	受信したシステムエクスクルーシブメッセージのチェックサムが違います。 送信データのチェックサムを確認してください。
This Parameter isn't Excl Data	ショーエクスクルーシブで見ようとしたパラメーターはエクスクルーシブ情報に変換できません。
No Parameter	ショーエクスクルーシブまたはショーコントロールチェンジで見ようとしたパラメーターは有効なパラメーターではありません。
Rcv CH is OFF!	ショーコントロールで見ようとしたパラメーターはパートのレシーブチャンネルがOFFになっているためMIDI情報に変換できません。レシーブチャンネルを設定してください。
PB Com ERROR!	<div><ul style="list-style-type: none"><li>・ MU100R本体とプラグインボードとの通信上でエラーが発生しました。電源を切って、プラグインコネクターが正しく差し込まれているか確認してください。</li><li>・ 大量のMIDI情報を短時間に受信したため、プラグインボードでの処理が間に合いませんでした。不要なMIDI情報はなるべく送らないようにしてください。</li></ul></div>

## ■ イニシャライズ

MU100R内部の設定を工場出荷状態などの一定の初期状態に戻します。



1. ユーティリティのメニューで[SELECT $\odot/\odot$ ]ボタンを押して「INITIAL」を選びます。



2. [ENTER]ボタンを押します。



3. [SELECT $\odot/\odot$ ]ボタンを押して、イニシャライズしたい項目を選びます。

選択した項目が点滅します



4. [ENTER]ボタンを押して、イニシャライズの確認画面に入ります。



5. [ENTER]ボタンを押して、イニシャライズを実行します。

終了すると、自動的にイニシャライズメニュー手順3に戻ります。



操作の途中で中止したいときは、[EXIT]ボタンを押すとイニシャライズメニューに戻ります。



- ・ イニシャライズを実行すると、メモリーやバッファーの中に入っているMU100Rのデータは消えてしまいます。大切なデータはあらかじめコンピュータやYAMAHA MDF2などのMIDIデータファイルなどに保存してください。
- ・ サウンドモジュールモードを切り替えたときも、ここでのイニシャライズと同様に初期化されません。

(1) FactSet(ファクトリーセット)

マルチ、パフォーマンス、エフェクト、イコライザー、システムセットアップを含むすべての内部設定を工場出荷状態に戻します。

(2) XG Init(XGイニシャライズ)(サウンドモジュールモードがXGのときのみ表示)

(3) GM Init(GMイニシャライズ)(サウンドモジュールモードがTG300Bのときのみ表示)

(4) C/M Init(C/Mイニシャライズ)(サウンドモジュールモードがC/Mのときのみ表示)

以下の設定を、各サウンドモジュールモードの初期状態に戻します。

- マルチパートコントロール
- マルチオールパートコントロール
- マルチパートエディット
- エフェクト
- イコライザー



パフォーマンスモードの設定は初期化されません。

(5) PFMInit(パフォーマンスイニシャライズ)(サウンドモジュールモードがPFMのときのみ表示)

パフォーマンスエディットバッファーを初期状態に戻します。



パフォーマンスのインターナルメモリーは初期化されません。

(6) DrumInit(ドラムイニシャライズ)(サウンドモジュールモードがXG、TG300B、C/Mのいずれかのときのみ表示)

ドラムセットアップ(drumS1～4)の設定を初期化します。



初期化するドラムセットアップ(drumS1～4)をVALUE[+] [-] ボタンで選択します。

■ EFFECT (エフェクト)

1.A/D Input Preset

			A/D1												
			A/D2												
BANK	Source		PGM CNG# = 0	1	2	3	4	5	6	7	8	9	10	11	12
0	MIC	Preset Name input gain var type	Off mic -	Mic mic -	Reverb mic -	Chorus mic -	Chorus+Reverb mic -	Karaoke1 mic Karaoke1	Karaoke2 mic Karaoke2	Karaoke3 mic Karaoke3	Echo mic Echo	Vocal mic Stage1	Studio mic Exciter	Oct Up mic Pitch Change	Oct Down mic Pitch Change
1	GUITAR (Note 1)	Preset Name input gain var type	Off mic -	Guitar mic -	Reverb mic -	Chorus mic -	Chorus+Reverb mic -	Tube mic Amp Sim.	Stack mic Amp Sim.	Flang Gtr mic Flanger	Clean Gtr mic Celeste	Funk Gtr mic Touch Wah	Tremolo mic Tremolo	Phaser mic Phaser	5th Guitar mic Pitch Change
2	KEYBOARD	Preset Name input gain var type	Off line -	Keyboard line -	Reverb line -	Chorus line -	Chorus+Reverb line -	Phaser EP line Phaser	Pan EP line Auto Pan	Wah Clavi line Touch Wah	Rotary Orgn line Rotary Speaker	Synth Str line Symphonic	Synth Pad line Flanger2	Synth Lead line Delay LCR	SFX line Pitch Change
3	AUDIO (Note 2)	Preset Name input gain var type	Off line -	Audio line -	Reverb line -	Chorus line -	Chorus+Reverb line -								
18	STEREO KEYBOARD (Note 3)	Preset Name input gain var type	Off line -	Keyboard line -	Reverb line -	Chorus line -	Chorus+Reverb line -	Phaser EP line Phaser	Pan EP line Auto Pan	Wah Clavi line Touch Wah	Rotary Orgn line Rotary Speaker	Synth Str line Symphonic	Synth Pad line Flanger2	Synth Lead line Delay LCR	SFX line Pitch Change
19	STEREO AUDIO (Note 3)	Preset Name input gain var type	Off line -	Audio line -	Reverb line -	Chorus line -	Chorus+Reverb line -								

- (Note 1) Depending on the guitar, the input may be distorted. Adjust the A/D INPUT VOLUME or the volume of your guitar.
- (Note 2) AUDIO sets PAN to Lch for A/D1 and Rch for A/D2.
- (Note 3) The Stereo setting can be selected only for A/D1.
- The A/D1 and A/D2 inputs will be handled as the Lch and Rch respectively of a stereo signal.
- Thus, when you select Stereo, the bank number and program number of part A2 will be displayed as "\*\*\*" and cannot be set.

2. Effect Type List

REVERB

No.	MSB	LSB	Effect Type	Remarks
0	00H	00H	NO EFFECT	Turn off the effect.
1	01H	00H	HALL 1	Reverb simulating the acoustics of a hall.
2	01H	01H	HALL 2	-
3	02H	00H	ROOM 1	Reverb simulating the acoustics of a room.
4	02H	01H	ROOM 2	-
5	02H	02H	ROOM 3	-
6	03H	00H	STAGE 1	Reverb appropriate for a solo instrument.
7	03H	01H	STAGE 2	-
8	04H	00H	PLATE	Reverb simulating a metal plate reverb device.
9	10H	00H	WHITE ROOM	Unique short reverb with a slight initial delay.
10	11H	00H	TUNNEL	Simulation of a cylindrical space extending to left and right.
11	12H	00H	CANYON	A hypothetical acoustic space which extends without limit.
12	13H	00H	BASEMENT	Reverb with distinctive resonance following a slight initial delay.

CHORUS

No.	MSB	LSB	Effect Type	Remarks
0	00H	00H	NO EFFECT	Turn off the effect.
1	41H	00H	CHORUS 1	A standard chorus effect, adding natural spaciousness to the sound.
2	41H	01H	CHORUS 2	-
3	41H	02H	CHORUS 3	-
4	41H	08H	CHORUS 4	-
5	42H	00H	CELESTE 1	An effect which uses a 3-phase LFO to add modulation and spaciousness to the sound.
6	42H	01H	CELESTE 2	-
7	42H	02H	CELESTE 3	-
8	42H	08H	CELESTE 4	-
9	43H	00H	FLANGER 1	An effect reminiscent of a jet airplane taking off and landing.
10	43H	01H	FLANGER 2	-
11	43H	08H	FLANGER 3	-
12	44H	00H	SYMPHONIC	A multi-stage version of CELESTE modulation.
13	57H	00H	ENSEMBLE DETUNE	Chorus effect without modulation, created by adding a slightly pitch-shifted sound.
14	48H	00H	PHASER 1	Cyclically changes the phase to modulate the sound.

VARIATION

No.	MSB	LSB	Effect Type	Remarks
0	00H	00H	NO EFFECT	Turns off the effect.
1	01H	00H	HALL 1	Reverb simulating the acoustics of a hall.
2	01H	01H	HALL 2	~
3	02H	00H	ROOM 1	Reverb simulating the acoustics of a room.
4	02H	01H	ROOM 2	~
5	02H	02H	ROOM 3	~
6	03H	00H	STAGE 1	Reverb appropriate for a solo instrument.
7	03H	01H	STAGE 2	~
8	04H	00H	PLATE	Reverb simulating a metal plate reverb device.
9	10H	00H	WHITE ROOM	Distinctive short reverb with a slight initial delay.
10	11H	00H	TUNNEL	Simulation of a cylindrical space extending to left and right.
11	12H	00H	CANYON	A hypothetical acoustic space which extends without limit.
12	13H	00H	BASEMENT	Reverb with distinctive resonance following a slight initial delay.
13	05H	00H	DELAY L,C,R	Three delay sounds L, R and C (center).
14	06H	00H	DELAY L,R	Two delay sounds L and R, with two feedback delays.
15	07H	00H	ECHO	Two delays L and R, with independent feedback delay for L and R.
16	08H	00H	CROSS DELAY	This effect crosses the feedback of two delays.
17	09H	00H	ER 1	This effect isolates only the early reflection components of the reverb.
18	09H	01H	ER 2	~
19	0AH	00H	GATE REVERB	Simulation of gated reverb.
20	0BH	00H	REVERSE GATE	Simulation of gated reverb played back in reverse.
21	14H	00H	KARAOKE 1	Echo for karaoke.
22	14H	01H	KARAOKE 2	~
23	14H	02H	KARAOKE 3	~
24	41H	00H	CHORUS 1	Conventional chorus effect which gives natural spaciousness to the sound.
25	41H	01H	CHORUS 2	~
26	41H	02H	CHORUS 3	~
27	41H	08H	CHORUS 4	~
28	42H	00H	CELESTE 1	A three-phase LFO is used to give modulation and spaciousness to the sound.
29	42H	01H	CELESTE 2	~
30	42H	02H	CELESTE 3	~
31	42H	08H	CELESTE 4	~
32	43H	00H	FLANGER 1	An effect reminiscent of a jet airplane taking off and landing.
33	43H	01H	FLANGER 2	~
34	43H	08H	FLANGER 3	~
35	44H	00H	SYMPHONIC	A multi-stage version of CELESTE modulation.
36	57H	00H	ENSEMBLE DETUNE	Chorus effect without modulation, created by adding a slightly pitch-shifted sound.
37	58H	00H	AMBIENCE	An effect which adds spatial breadth by blurring the location of the sound.
38	45H	00H	ROTARY SPEAKER	Simulation of a rotary speaker. AC1 (assignable controller 1) etc. can be used to control the rotation speed.
39	56H	00H	2WAY ROTARY SPEAKER	Simulation of a rotary speaker. AC1 (assignable controller 1) etc. can be used to control the rotation speed.
40	46H	00H	TREMOLO	An effect which cyclically modulates the volume.
41	47H	00H	AUTO PAN	An effect which cyclically moves the sound between left/right and front/back.
42	48H	00H	PHASER 1	Cyclically changes the phase to modulate the sound.
43	48H	08H	PHASER 2	~
44	49H	00H	DISTORTION	Adds distortion with an edge to the sound. Since a noise gate is included, this is suitable for use with A/D input as well.
45	49H	01H	COMP+DISTORTION	Since a compressor is included in the first stage, distortion can be applied evenly, regardless of the input level.
46	4AH	00H	OVER DRIVE	Adds mild distortion to the sound. Since a noise gate is included, this is suitable for A/D input as well.
47	4BH	00H	AMP SIMULATOR	Simulation of a guitar amp. Since a noise gate is included, this is suitable for use with A/D input as well.
48	4CH	00H	3BAND EQ(MONO)	Mono EQ with equalization of LOW, MID and HIGH.
49	4DH	00H	2BAND EQ(STEREO)	Stereo EQ with equalization of LOW and HIGH. Ideal for Drum Parts.
50	4EH	00H	AUTO WAH(LFO)	Cyclically changes the center frequency of a wah filter. Can also be used with AC1 etc. as a pedal wah.
51	4EH	01H	AUTO WAH+DIST	Applies DISTORTION to the output of AUTO WAH to distort the sound. Can also be used with AC1 etc. as a pedal wah.
52	4EH	02H	AUTO WAH+ODRV	Applies OVERDRIVE to the output of AUTO WAH to distort the sound. Can also be used with AC1 etc. as a pedal wah.
53	52H	00H	TOUCH WAH 1	Changes the center frequency of a wah filter according to the input level. Can also be used with AC1 etc. as a pedal wah.
54	52H	01H	TOUCH WAH 2	Applies DISTORTION to the output of TOUCH WAH to distort the sound. Can also be used with AC1 etc. as a pedal wah.
55	52H	02H	TOUCH WAH+DIST	Applies OVERDRIVE to the output of TOUCH WAH to distort the sound. Can also be used with AC1 etc. as a pedal wah.
56	52H	08H	TOUCH WAH+ODRV	Changes the center frequency of a wah filter according to the input level. Can also be used with AC1 etc. as a pedal wah.
57	50H	00H	PITCH CHANGE 1	This effect changes the pitch of the input signal.
58	50H	01H	PITCH CHANGE 2	~
59	51H	00H	AURAL EXCITER®	This effect adds new overtones to the input signal to make the sound stand out.
60	53H	00H	COMPRESSOR	Holds down the output when the input exceeds a specified level. Can also be used to add a sense of attack to the sound.
61	54H	00H	NOISE GATE	Gates the input when the input signal falls below a specified level. Useful for cutting noise from the A/D input, etc.
62	55H	00H	VOICE CANCEL	Attenuates the vocal part from sources such as CDs.
63	5DH	00H	TALKING MODULATOR	Adds a vowel sound to the input signal.
64	5EH	00H	LO-FI	Degrades the audio quality of the input signal.
65	5FH	00H	DIST+DELAY	DISTORTION and DELAY are connected in series.
66	5FH	01H	OVERDRIVE+DELAY	OVERDRIVE and DELAY are connected in series.
67	60H	00H	COMP+DIST+DELAY	COMPRESSOR, DISTORTION and DELAY are connected in series.
68	60H	01H	COMP+OVERDRIVE+DELAY	COMPRESSOR, OVERDRIVE and DELAY are connected in series.
69	61H	00H	WAH+DIST+DELAY	TOUCH WAH, DISTORTION and DELAY are connected in series.
70	61H	01H	WAH+OVERDRIVE+DELAY	TOUCH WAH, OVERDRIVE and DELAY are connected in series.
71	40H	00H	THRU	Bypass without applying an effect.

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INSERTION1,2

No.	MSB	LSB	Effect Type	Remarks
0	40H	00H	THRU	Bypass without applying an effect.
1	01H	00H	HALL 1	Reverb simulating the acoustics of a hall.
2	01H	01H	HALL 2	-
3	02H	00H	ROOM 1	Reverb simulating the acoustics of a room.
4	02H	01H	ROOM 2	-
5	02H	02H	ROOM 3	-
6	03H	00H	STAGE 1	Reverb appropriate for a solo instrument.
7	03H	01H	STAGE 2	-
8	04H	00H	PLATE	Reverb simulating a metal plate reverb device.
9	05H	00H	DELAY L,C,R	Three delay sounds L, R and C (center).
10	06H	00H	DELAY L,R	Two delay sounds L and R, with two feedback delays.
11	07H	00H	ECHO	Two delays L and R, with independent feedback delay for L and R.
12	08H	00H	CROSS DELAY	This effect crosses the feedback of two delays.
13	14H	00H	KARAOKE 1	Echo for karaoke.
14	14H	01H	KARAOKE 2	-
15	14H	02H	KARAOKE 3	-
16	41H	00H	CHORUS 1	Conventional chorus effect which gives natural spaciousness to the sound.
17	41H	01H	CHORUS 2	-
18	41H	02H	CHORUS 3	-
19	41H	08H	CHORUS 4	-
20	42H	00H	CELESTE 1	A three-phase LFO is used to give modulation and spaciousness to the sound.
21	42H	01H	CELESTE 2	-
22	42H	02H	CELESTE 3	-
23	42H	08H	CELESTE 4	-
24	43H	00H	FLANGER 1	An effect reminiscent of a jet airplane taking off and landing.
25	43H	01H	FLANGER 2	-
26	43H	08H	FLANGER 3	-
27	44H	00H	SYMPHONIC	A multi-stage version of CELESTE modulation.
28	57H	00H	ENSEMBLE DETUNE	Chorus effect without modulation, created by adding a slightly pitch-shifted sound.
29	45H	00H	ROTARY SPEAKER	Simulation of a rotary speaker. AC1 (assignable controller 1) etc. can be used to control the rotation speed.
30	46H	00H	TREMOLO	An effect which cyclically modulates the volume.
31	47H	00H	AUTO PAN	An effect which cyclically moves the sound between left/right and front/back.
32	48H	00H	PHASER 1	Cyclically changes the phase to modulate the sound.
33	49H	00H	DISTORTION	Adds distortion with an edge to the sound.
34	4AH	00H	OVER DRIVE	Adds mild distortion to the sound.
35	4BH	00H	AMP SIMULATOR	Simulation of a guitar amp.
36	4CH	00H	3BAND EQ(MONO)	Mono EQ with equalization of LOW, MID and HIGH.
37	4DH	00H	2BAND EQ(STEREO)	Stereo EQ with equalization of LOW and HIGH. Ideal for Drum Parts.
38	4EH	00H	AUTO WAH(LFO)	Cyclically changes the center frequency of a wah filter. Can also be used with AC1 etc. as a pedal wah.
39	52H	00H	TOUCH WAH 1	Changes the center frequency of a wah filter according to the input level. Can also be used with AC1 etc. as a pedal wah.
40	52H	08H	TOUCH WAH 2	Changes the center frequency of a wah filter according to the input level. Can also be used with AC1 etc. as a pedal wah.
41	51H	00H	AURAL EXCITER®	This effect adds new overtones to the input signal to make the sound stand out.
42	53H	00H	COMPRESSOR	Holds down the output when the input exceeds a specified level. Can also be used to add a sense of attack to the sound.
43	54H	00H	NOISE GATE	Gates the input when the input signal falls below a specified level. Useful for cutting noise from the A/D input, etc.

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3. Effect LSB/MSB List

REVERB TYPE

TYPE MSB		TYPE LSB				
DEC	HEX	00	01	02	...	08
000	0	NO EFFECT				
001	1	HALL 1	HALL 2			
002	2	ROOM 1	ROOM 2	ROOM 3		
003	3	STAGE 1	STAGE 2			
004	4	PLATE				
005	5	NO EFFECT				
:	:	:				
015	F	NO EFFECT				
016	10	WHITE ROOM				
017	11	TUNNEL				
018	12	CANYON				
019	13	BASEMENT				
020	14	NO EFFECT				
:	:	:				
127	7F	NO EFFECT				

NO EFFECT

Same as basic effects (LSB=00)

CHORUS TYPE

TYPE MSB		TYPE LSB				
DEC	HEX	00	01	02	...	08
000	0	NO EFFECT				
001	1	NO EFFECT				
:	:	:				
064	40	NO EFFECT				
065	41	CHORUS 1	CHORUS 2	CHORUS 3		CHORUS 4
066	42	CELESTE 1	CELESTE 2	CELESTE 3		CELESTE 4
067	43	FLANGER 1	FLANGER 2			FLANGER 3
068	44	SYMPHONIC				
069	45	NO EFFECT				
:	:	:				
071	47	NO EFFECT				
072	48	PHASER 1				
073	49	NO EFFECT				
:	:	:				
086	56	NO EFFECT				
087	57	ENSEMBLE DETUNE				
088	58	NO EFFECT				
:	:	:				
127	7F	NO EFFECT				

NO EFFECT

Same as basic effects (LSB=00)



VARIATION TYPE
 (MSB=0 - 63)

TYPE MSB		TYPE LSB				
DEC	HEX	00	01	02	...	08
000	0	NO EFFECT				
001	1	HALL 1	HALL 2			
002	2	ROOM 1	ROOM 2	ROOM 3		
003	3	STAGE 1	STAGE 2			
004	4	PLATE				
005	5	DELAY L,C,R				
006	6	DELAY L,R				
007	7	ECHO				
008	8	CROSS DELAY				
009	9	ER 1	ER 2			
010	A	GATE REVERB				
011	B	REVERSE GATE				
012	C	NO EFFECT or THRU				
:	:	:				
015	F	NO EFFECT or THRU				
016	10	WHITE ROOM				
017	11	TUNNEL				
018	12	CANYON				
019	13	BASEMENT				
020	14	KARAOKE 1	KARAOKE 2	KARAOKE 3		
021	15	NO EFFECT or THRU				
:	:	:				
063	3F	NO EFFECT or THRU				

NO EFFECT (for SYS) or THRU (for INS)

Same as basic effects (LSB=00)

VARIATION TYPE
 (MSB=64 - 127)

TYPE MSB		TYPE LSB				
DEC	HEX	00	01	02	...	08
064	40	THRU				
065	41	CHORUS 1	CHORUS 2	CHORUS 3		CHORUS 4
066	42	CELESTE 1	CELESTE 2	CELESTE 3		CELESTE 4
067	43	FLANGER 1	FLANGER 2			FLANGER 3
068	44	SYMPHONIC				
069	45	ROTARY SPEAKER				
070	46	TREMOLO				
071	47	AUTO PAN				
072	48	PHASER 1				PHASER 2
073	49	DISTORTION	COMP+DISTORTION			
074	4A	OVER DRIVE				
075	4B	AMP SIMULATOR				
076	4C	3-BAND EQ				
077	4D	2-BAND EQ				
078	4E	AUTO WAH(LFO)	AUTO WAH+DIST	AUTO WAH+OVERDRIVE		
079	4F	THRU				
080	50	PITCH CHANGE1	PITCH CHANGE2			
081	51	AURAL EXCITER®				
082	52	TOUCH WAH 1	TOUCH WAH+DIST	TOUCH WAH+OVERDRIVE		TOUCH WAH 2
083	53	COMPRESSOR				
084	54	NOISE GATE				
085	55	VOICE CANCEL				
086	56	2WAY ROTARY SPEAKER				
087	57	ENSEMBLE DETUNE				
088	58	AMBIENCE				
089	59	THRU				
:	:	:				
092	5C	THRU				
093	5D	TALKING MODULATOR				
094	5E	LO-FI				
095	5F	DIST+DELAY	OVERDRIVE+DELAY			
096	60	COMP+DIST+DELAY	COMP+OVERDRIVE+DELAY			
097	61	WAH+DIST+DELAY	WAH+OVERDRIVE+DELAY			
098	62	THRU				
:	:	:				
127	7F	THRU				

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THRU

Same as basic effects (LSB=00)

INSERTION TYPE

TYPE MSB		TYPE LSB				
DEC	HEX	00	01	02	...	08
000	0	THRU				
001	1	HALL 1	HALL 2			
002	2	ROOM 1	ROOM 2	ROOM 3		
003	3	STAGE 1	STAGE 2			
004	4	PLATE				
005	5	DELAY L,C,R				
006	6	DELAY L,R				
007	7	ECHO				
008	8	CROSS DELAY				
009	9	THRU				
:	:	:				
019	13	THRU				
020	14	KARAOKE 1	KARAOKE 2	KARAOKE 3		
021	15	THRU				
:	:	:				
063	3F	THRU				
064	40	THRU				
065	41	CHORUS 1	CHORUS 2	CHORUS 3		CHORUS 4
066	42	CELESTE 1	CELESTE 2	CELESTE 3		CELESTE 4
067	43	FLANGER 1	FLANGER 2	FLANGER 3		
068	44	SYMPHONIC				
069	45	ROTARY SPEAKER				
070	46	TREMOLO				
071	47	AUTO PAN				
072	48	PHASER 1				
073	49	DISTORTION				
074	4A	OVER DRIVE				
075	4B	AMP SIMULATOR				
076	4C	3BAND EQ				
077	4D	2-BAND EQ				
078	4E	AUTO WAH(LFO)				
079	4F	THRU				
080	50	THRU				
081	51	AURAL EXCITER®				
082	52	TOUCH WAH 1				TOUCH WAH 2
083	53	COMPRESSOR				
084	54	NOISE GATE				
085	55	THRU				
086	56	THRU				
087	57	ENSEMBLE DETUNE				
088	58	THRU				
:	:	:				
127	7F	THRU				

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UNIQUE INSERTION EFFECT (HARMONY) TYPE

TYPE MSB		TYPE LSB				
DEC	HEX	00	01	02	...	08
000	0	THRU				
:	:	:				
088	58	THRU				
089	59	VOCODER HARMONY				
090	5A	CHORDAL HARMONY				
091	5B	DETUNE HARMONY				
092	5C	CHROMATIC HARMONY				
093	5D	THRU				
:	:	:				
127	7F	THRU				

 THRU  Same as basic effects (LSB=00)

4. Effect Parameter List

Note

- Parameters marked with a ● in the "Control" column can be controlled from an AC1 (assignable controller 1) etc. However, this is valid only for a Variation effect (when selected for Insertion) and for Insertion effects 1/2.
- Dry/Wet is valid only for a Variation effect (when selected for Insertion) and for Insertion effects 1/2.
- Parameters 1 - 5 can be edited from the front panel of the MU100R.
- Abbreviations used in the effect block diagrams
  - LPF = Low Pass Filter
  - HPF = High Pass Filter
  - LSF = Low Shelving Filter
  - HSF = High Shelving Filter
  - PDF = Peak Dip Filter
  - EF = Envelope Follower
  - ER = Early Reflection

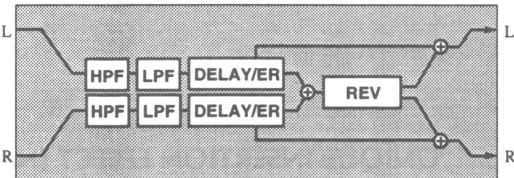
- HALL1, 2  
ROOM1, 2, 3  
STAGE1, 2  
PLATE (Reverb, Variation, Insertion1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Reverb Time	0.3 - 30.0s	0-69	table#4	
2	Diffusion	0 - 10	0-10		
3	Initial Delay	0 - 63	0-63	table#5	
4	HPF Cutoff	Thru - 8.0kHz	0-52	table#3	
5	LPF Cutoff	1.0k - Thru	34-60	table#3	
6					
7					
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1-127		●
11	Rev Delay	0 - 63	0-63	table#5	
12	Density	0 - 4 (reverb, variation block)	0-4		
13	Er/Rev Balance	0 - 2 (insertion1, 2 block)	0-2		
14	High Damp	E63>R - E=R - E<R63	1-127		
15	Feedback Level	0.1 - 1.0	1-10		
16		-63 - +63	1-127		

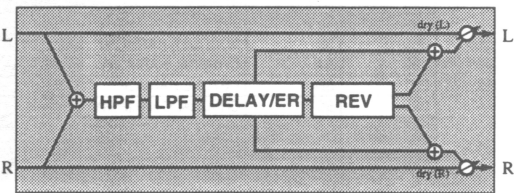
- WHITE ROOM  
TUNNEL  
CANYON  
BASEMENT (Reverb, Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Reverb Time	0.3 - 30.0s	0-69	table#4	
2	Diffusion	0 - 10	0-10		
3	Initial Delay	0 - 63	0-63	table#5	
4	HPF Cutoff	Thru - 8.0kHz	0-52	table#3	
5	LPF Cutoff	1.0k - Thru	34-60	table#3	
6	Width	0.5 - 10.2m	0-37	table#11	
7	Height	0.5 - 20.2m	0-73	table#11	
8	Depth	0.5 - 30.2m	0-104	table#11	
9	Wall Vary	0 - 30	0-30		
10	Dry/Wet	D63>W - D=W - D<W63	1-127		●
11	Rev Delay	0 - 63	0-63	table#5	
12	Density	0 - 4	0-4		
13	Er/Rev Balance	E63>R - E=R - E<R63	1-127		
14	High Damp	0.1 - 1.0	1-10		
15	Feedback Level	-63 - +63	1-127		
16					

Reverb Block

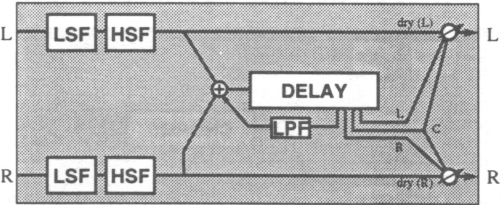


Variation, Insertion Block



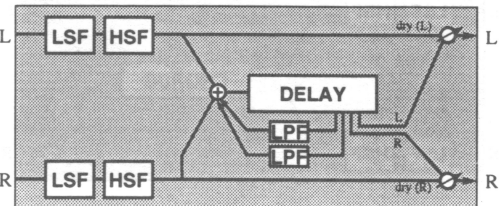
● DELAY L, C, R  
(Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Lch Delay	0.1 - 1486.0ms (variation block)	1-14860		
2	Rch Delay	0.1 - 742.9ms (insertion1,2 block)	1-7429		
3	Cch Delay	0.1 - 1486.0ms (variation block)	1-14860		
4	Feedback Delay	0.1 - 742.9ms (insertion1,2 block)	1-7429		
5	Feedback Level	0.1 - 1486.0ms (variation block)	1-14860		
6	Cch Level	-63 - +63	1-127		
7	High Damp	0 - 127	0-127		
8	Dry/Wet	0.1 - 1.0	1-10		
9					
10	Dry/Wet	D63>W - D=W - D<W63	1-127		●
11					
12	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
13	EQ Low Gain	-12 - +12dB	52-76		
14	EQ High Frequency	500Hz - 16.0kHz	28-58	table#3	
15	EQ High Gain	-12 - +12dB	52-76		
16					



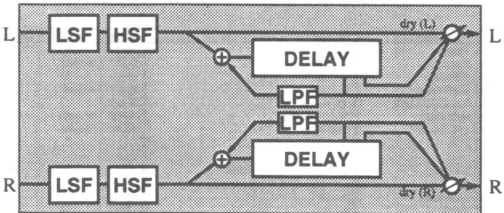
● DELAY L, R (Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Lch Delay	0.1 - 1486.0ms (variation block)	1-14860		
2	Rch Delay	0.1 - 742.9ms (insertion1,2 block)	1-7429		
3	Feedback Delay 1	0.1 - 1486.0ms (variation block)	1-14860		
4	Feedback Delay 2	0.1 - 742.9ms (insertion1,2 block)	1-7429		
5	Feedback Level	0.1 - 1486.0ms (variation block)	1-14860		
6	High Damp	-63 - +63	1-127		
7		0 - 127	0-127		
8	Dry/Wet	0.1 - 1.0	1-10		
9					
10	Dry/Wet	D63>W - D=W - D<W63	1-127		●
11					
12	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
13	EQ Low Gain	-12 - +12dB	52-76		
14	EQ High Frequency	500Hz - 16.0kHz	28-58	table#3	
15	EQ High Gain	-12 - +12dB	52-76		
16					



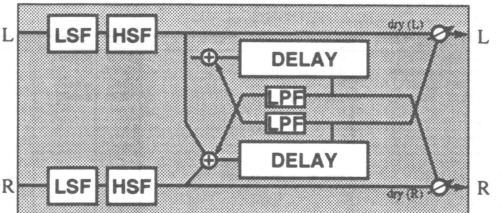
● ECHO (Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Lch Delay1	0.1 - 743.0ms (variation block)	1-7430		
2	Lch Feedback Level	0.1 - 371.4ms (insertion1,2 block)	1-3714		
3	Rch Delay1	-63 - +63	1-127		
4	Rch Feedback Level	0.1 - 743.0ms (variation block)	1-7430		
5	High Damp	0.1 - 371.4ms (insertion1,2 block)	1-3714		
6	Lch Delay2	0.1 - 1.0	1-10		
7	Rch Delay2	0.1 - 743.0ms (variation block)	1-7430		
8	Delay2 Level	0.1 - 371.4ms (insertion1,2 block)	1-3714		
9		0 - 127	0-127		
10	Dry/Wet	D63>W - D=W - D<W63	1-127		●
11					
12	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
13	EQ Low Gain	-12 - +12dB	52-76		
14	EQ High Frequency	500Hz - 16.0kHz	28-58	table#3	
15	EQ High Gain	-12 - +12dB	52-76		
16					



● CROSS DELAY  
(Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	L->R Delay	0.1 - 743.0ms (variation block)	1-7430		
2	R->L Delay	0.1 - 371.4ms (insertion1,2 block)	1-3714		
3	Feedback Level	0.1 - 743.0ms (variation block)	1-7430		
4	Input Select	0.1 - 371.4ms (insertion1,2 block)	1-3714		
5	High Damp	-63 - +63	1-127		
6		L,R,L&R	0-2		
7		0.1 - 1.0	1-10		
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1-127		●
11					
12	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
13	EQ Low Gain	-12 - +12dB	52-76		
14	EQ High Frequency	500Hz - 16.0kHz	28-58	table#3	
15	EQ High Gain	-12 - +12dB	52-76		
16					



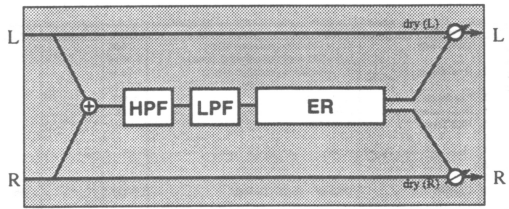


EARLY REF 1, 2 (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Type	S-H, L-H, Rdm, Rvs, Plt, Spr	0-5		
2	Room Size	0.1 - 7.0	0-44	table#6	
3	Diffusion	0 - 10	0-10		
4	Initial Delay	0 - 63	0-63	table#5	
5	Feedback Level	-63 - +63	1-127		
6	HPF Cutoff	Thru - 8.0kHz	0-52	table#3	
7	LPF Cutoff	1.0k - Thru	34-60	table#3	
8					
9					
10	Dry/Wet	D63>W - D<W - D<W63	1-127		●
11	Liveness	0 - 10	0-10		
12	Density	0 - 3	0-3		
13	High Damp	0.1 - 1.0	1-10		
14					
15					
16					

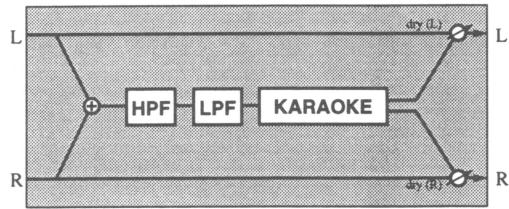
GATE REVERB  
REVERSE GATE (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Type	TypeA, TypeB	0-1		
2	Room Size	0.1 - 20.0	0-127	table#6	
3	Diffusion	0 - 10	0-10		
4	Initial Delay	0 - 127	0-127	table#5	
5	Feedback Level	-63 - +63	1-127		
6	HPF Cutoff	Thru - 8.0kHz	0-52	table#3	
7	LPF Cutoff	1.0k - Thru	34-60	table#3	
8					
9					
10	Dry/Wet	D63>W - D<W - D<W63	1-127		●
11	Liveness	0 - 10	0-10		
12	Density	0 - 3	0-3		
13	High Damp	0.1 - 1.0	1-10		
14					
15					
16					



KARAOKE1, 2, 3 (Variation, Insertion 1, 2 block)

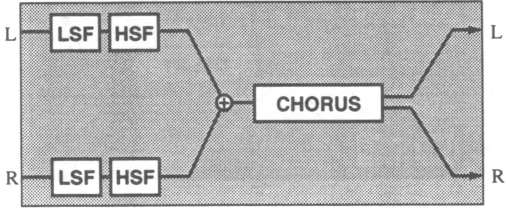
No.	Parameter	Display	Value	See Table	Control
1	Delay Time	0 - 127	0-127	table#7	
2	Feedback Level	-63 - +63	1-127		
3	HPF Cutoff	Thru - 8.0kHz	0-52	table#3	
4	LPF Cutoff	1.0k - Thru	34-60	table#3	
5					
6					
7					
8					
9					
10	Dry/Wet	D63>W - D<W - D<W63	1-127		●
11					
12					
13					
14					
15					
16					



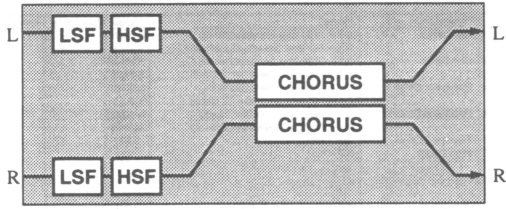
CHORUS 1, 2, 3, 4  
CELESTE 1, 2, 3, 4 (Chorus, Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0-127	table#1	
2	LFO Depth	0 - 127	0-127		
3	Feedback Level	-63 - +63	1-127		
4	Delay Offset	0 - 127	0-127	table#2	
5					
6	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 - +12dB	52-76		
8	EQ High Frequency	500Hz - 16.0kHz	28-56	table#3	
9	EQ High Gain	-12 - +12dB	52-76		
10	Dry/Wet	D63>W - D<W - D<W63	1-127		●
11	EQ Mid Frequency	100Hz - 10.0kHz (variation block)	14-54	table#3	
12	EQ Mid Gain	-12 - +12dB (variation block)	52-76		
13	EQ Mid Width	1.0 - 12.0 (variation block)	10-120		
14					
15	Input Mode	mono/stereo	0-1		
16					

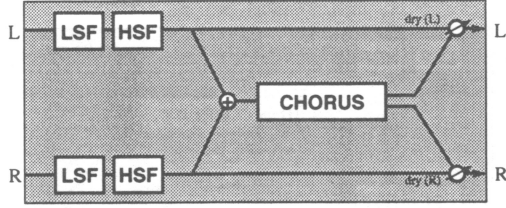
Chorus Block: when input mode = "mono"



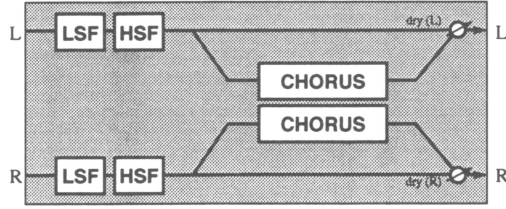
Chorus Block: when input mode = "stereo"



Variation, Insertion Block: when input mode = "mono"



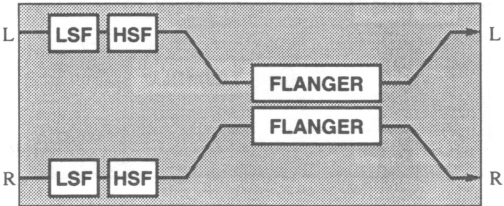
Variation, Insertion Block: when input mode = "stereo"



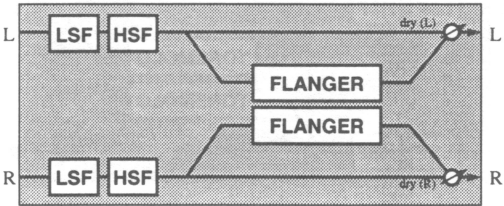
● FLANGER 1, 2, 3  
(Chorus, Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz – 39.7Hz	0-127	table#1	
2	LFO Depth	0 – 127	0-127		
3	Feedback Level	-63 – +63	1-127		
4	Delay Offset	0 – 63	0-63	table#2	
5					
6	EQ Low Frequency	32Hz – 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 – +12dB	52-76		
8	EQ High Frequency	500Hz – 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 – +12dB	52-76		
10	Dry/Wet	D63>W – D=W – D<W63	1-127		●
11	EQ Mid Frequency	100Hz – 10.0kHz (variation block)	14-54	table#3	
12	EQ Mid Gain	-12 – +12dB (variation block)	52-76		
13	EQ Mid Width	1.0 – 12.0 (variation block)	10-120		
14	LFO Phase Difference	-180 – +180deg	4-124	resolution=3deg.	
15					
16					

Chorus Block



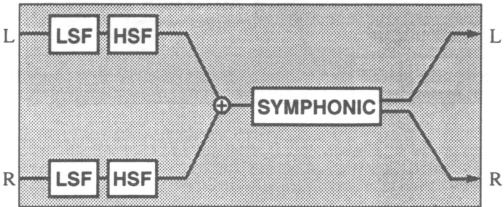
Variation, Insertion Block



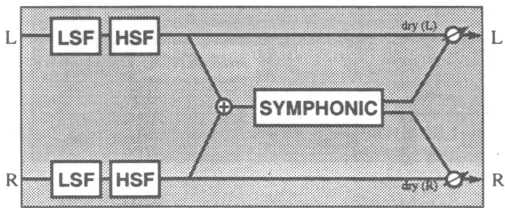
● SYMPHONIC  
(Chorus, Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz – 39.7Hz	0-127	table#1	
2	LFO Depth	0 – 127	0-127		
3	Delay Offset	0 – 127	0-127	table#2	
4					
5					
6	EQ Low Frequency	32Hz – 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 – +12dB	52-76		
8	EQ High Frequency	500Hz – 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 – +12dB	52-76		
10	Dry/Wet	D63>W – D=W – D<W63	1-127		●
11	EQ Mid Frequency	100Hz – 10.0kHz (variation block)	14-54	table#3	
12	EQ Mid Gain	-12 – +12dB (variation block)	52-76		
13	EQ Mid Width	1.0 – 12.0 (variation block)	10-120		
14					
15					
16					

Chorus Block



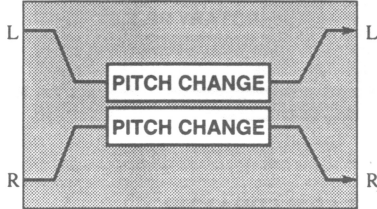
Variation, Insertion Block



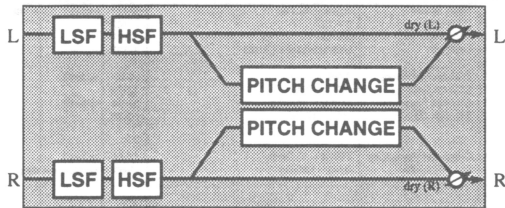
● ENSEMBLE DETUNE  
(Chorus, Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Detune	-50 – +50cent	14-114		
2	Lch Init Delay	0 – 127	0-127	table#2	
3	Rch Init Delay	0 – 127	0-127	table#2	
4					
5					
6					
7					
8					
9					
10	Dry/Wet	D63>W – D=W – D<W63	1-127		●
11	EQ Low Frequency	32Hz – 2.0kHz (variation, insertion1,2 block)	4-40	table#3	
12	EQ Low Gain	-12 – +12dB (variation, insertion1,2 block)	52-76		
13	EQ High Frequency	500Hz – 16.0kHz (variation, insertion1,2 block)	28-58	table#3	
14	EQ High Gain	-12 – +12dB (variation, insertion1,2 block)	52-76		
15					
16					

Chorus Block

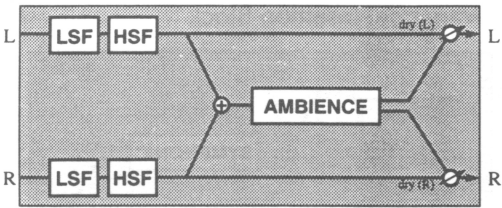


Variation, Insertion Block



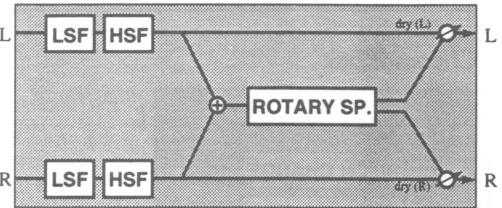
● AMBIENCE (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Delay Time	0 – 127	0-127	table#2	
2	Output Phase	normal/invers	0-1		
3					
4					
5					
6	EQ Low Frequency	32Hz – 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 – +12dB	52-76		
8	EQ High Frequency	500Hz – 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 – +12dB	52-76		
10	Dry/Wet	D63>W – D=W – D<W63	1-127		●
11					
12					
13					
14					
15					
16					



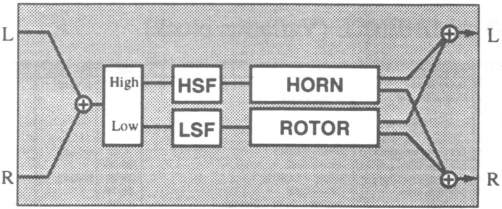
● ROTARY SPEAKER  
(Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz ~ 39.7Hz	0-127	table#1	●
2	LFO Depth	0 ~ 127	0-127	table#1	
3					
4					
5					
6	EQ Low Frequency	32Hz ~ 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 ~ +12dB	52-76	table#3	
8	EQ High Frequency	500Hz ~ 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 ~ +12dB	52-76	table#3	
10	Dry/Wet	D63>W ~ D<W63	1-127		
11	EQ Mid Frequency	100Hz ~ 10.0kHz (variation block)	14-54	table#3	
12	EQ Mid Gain	-12 ~ +12dB (variation block)	52-76		
13	EQ Mid Width	1.0 ~ 12.0 (variation block)	10-120		
14					
15					
16					



● 2WAY ROTARY SPEAKER  
(Variation block)

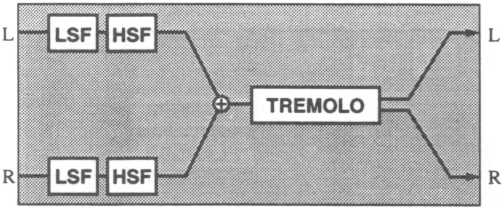
No.	Parameter	Display	Value	See Table	Control
1	Rotor Speed	0.0Hz ~ 39.7Hz	0-127	table#1	●
2	Drive Low	0 ~ 127	0-127	table#1	
3	Drive High	0 ~ 127	0-127	table#1	
4	Low/High	L63>H ~ L<H ~ L<H63	1-127		
5					
6	EQ Low Frequency	32Hz ~ 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 ~ +12dB	52-76	table#3	
8	EQ High Frequency	500Hz ~ 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 ~ +12dB	52-76	table#3	
10					
11	Crossover Frequency	100Hz ~ 10.0kHz	14-54	table#3	
12	Mic L-R Angle	0deg ~ 180deg	0-60	resolution=3deg.	
13					
14					
15					
16					



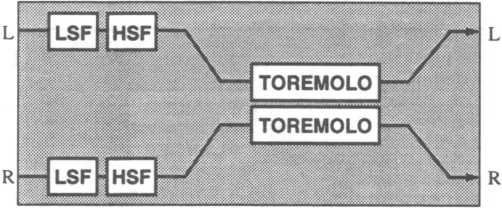
● TREMOLO (Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz ~ 39.7Hz	0-127	table#1	●
2	AM Depth	0 ~ 127	0-127	table#1	
3	PM Depth	0 ~ 127	0-127	table#1	
4					
5					
6	EQ Low Frequency	32Hz ~ 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 ~ +12dB	52-76	table#3	
8	EQ High Frequency	500Hz ~ 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 ~ +12dB	52-76	table#3	
10					
11	EQ Mid Frequency	100Hz ~ 10.0kHz (variation block)	14-54	table#3	
12	EQ Mid Gain	-12 ~ +12dB (variation block)	52-76		
13	EQ Mid Width	1.0 ~ 12.0 (variation block)	10-120		
14	LFO Phase Difference	-180 ~ +180deg	4-124	resolution=3deg.	
15	Input Mode	mono/stereo	0-1		
16					

When input mode="mono"

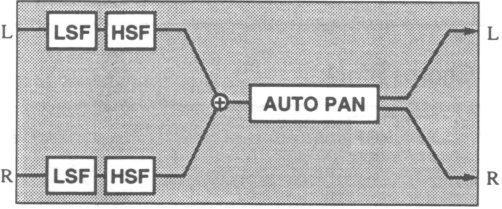


When input mode="stereo"



● AUTO PAN (Variation, Insertion 1, 2 block)

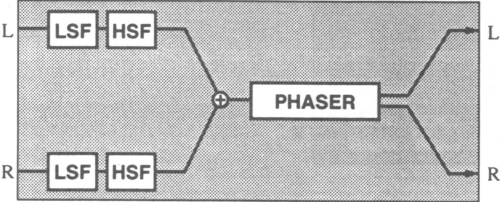
No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz ~ 39.7Hz	0-127	table#1	●
2	L/R Depth	0 ~ 127	0-127	table#1	
3	F/R Depth	0 ~ 127	0-127	table#1	
4	PAN Direction	L<->R, L->R, L<-R, L>R, R>L, R<->L	0-5		
5					
6	EQ Low Frequency	32Hz ~ 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 ~ +12dB	52-76	table#3	
8	EQ High Frequency	500Hz ~ 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 ~ +12dB	52-76	table#3	
10					
11	EQ Mid Frequency	100Hz ~ 10.0kHz (variation block)	14-54	table#3	
12	EQ Mid Gain	-12 ~ +12dB (variation block)	52-76		
13	EQ Mid Width	1.0 ~ 12.0 (variation block)	10-120		
14					
15					
16					



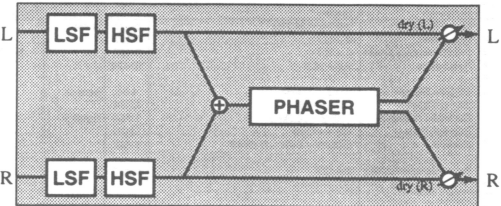
● PHASER 1  
(Chorus, Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0-127	table#1	
2	LFO Depth	0 - 127	0-127		
3	Phase Shift Offset	0 - 127	0-127		
4	Feedback Level	-63 - +63	1-127		
5					
6	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 - +12dB	52-76		
8	EQ High Frequency	500Hz - 16.0kHz	28-56	table#3	
9	EQ High Gain	-12 - +12dB	52-76		
10	Dry/Wet	D63>W - D=W - D<W63	1-127		●
11	Stage	4,5,6 (chorus, insertion1,2 block)	4-6		
12	Diffusion	4 - 12 (variation block)	4-12		
13		mono/stereo	0-1		
14					
15					
16					

Chorus Block

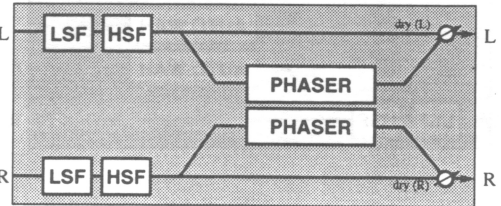


Variation, Insertion Block



● PHASER 2 (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0-127	table#1	
2	LFO Depth	0 - 127	0-127		
3	Phase Shift Offset	0 - 127	0-127		
4	Feedback Level	-63 - +63	1-127		
5					
6	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 - +12dB	52-76		
8	EQ High Frequency	500Hz - 16.0kHz	28-56	table#3	
9	EQ High Gain	-12 - +12dB	52-76		
10	Dry/Wet	D63>W - D=W - D<W63	1-127		●
11	Stage	3,4,5,6	3-6		
12	LFO Phase Difference	-180deg - +180deg	4-124	resolution=3deg.	
13					
14					
15					
16					



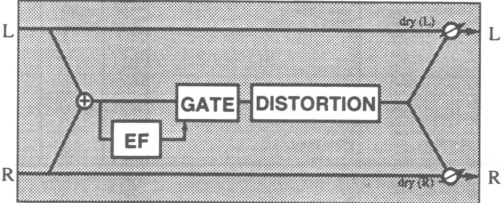
● DISTORTION  
OVERDRIVE (Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Drive	0 - 127	0-127		●
2	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
3	EQ Low Gain	-12 - +12dB	52-76		
4	LPF Cutoff	1.0k - Thru	34-60	table#3	
5	Output Level	0 - 127	0-127		
6					
7	EQ Mid Frequency	100Hz - 10.0kHz	14-54	table#3	
8	EQ Mid Gain	-12 - +12dB	52-76		
9	EQ Mid Width	1.0 - 12.0	10-120		
10	Dry/Wet	D63>W - D=W - D<W63	1-127		
11	Edge(Clip Curve)	0 - 127	0-127	mild to sharp	
12					
13					
14					
15					
16					

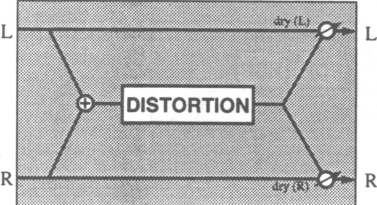
AMP SIMULATOR  
(Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Drive	0 - 127	0-127		●
2	AMP Type	Off, Stack, Combo, Tube	0-3		
3	LPF Cutoff	1.0k - Thru	34-60	table#3	
4	Output Level	0 - 127	0-127		
5					
6					
7					
8					
9					
10	Dry/Wet	D63>W - D=W - D<W63	1-127		
11	Edge(Clip Curve)	0 - 127	0-127	mild to sharp	
12					
13					
14					
15					
16					

Variation Block



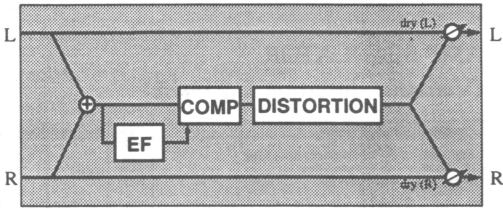
Insertion Block





● COMP+DIST (Variation block)

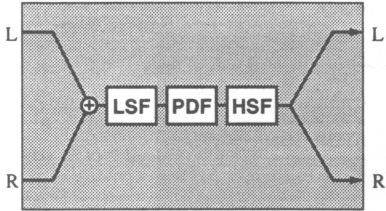
No.	Parameter	Display	Value	See Table	Control
1	Drive	0 - 127	0-127		●
2	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
3	EQ Low Gain	-12 - +12dB	52-76		
4	LPF Cutoff	1.0k - Thru	34-60	table#3	
5	Output Level	0 - 127	0-127		
6					
7	EQ Mid Frequency	100Hz - 10.0kHz	14-54	table#3	
8	EQ Mid Gain	-12 - +12dB	52-76		
9	EQ Mid Width	1.0 - 12.0	10-120		
10	Dry/Wet	D63> W - D=W - D<W63	1-127		
11	Edge(Clip Curve)	0 - 127	0-127	mild to sharp	
12	Attack	1ms - 40ms	0-19	table#8	
13	Release	10ms - 680ms	0-15	table#9	
14	Threshold	-48dB - -6dB	79-121		
15	Ratio	1.0 - 20.0	0-7	table#10	
16					



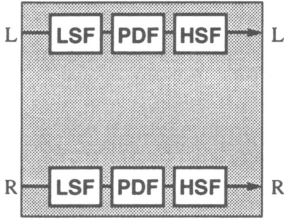
● 3BAND EQ (MONO)  
(Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	EQ Low Gain	-12 - +12dB	52-76		
2	EQ Mid Frequency	100Hz - 10.0kHz	14-54	table#3	
3	EQ Mid Gain	-12 - +12dB	52-76		
4	EQ Mid Width	1.0 - 12.0	10-120		
5	EQ High Gain	-12 - +12dB	52-76		
6	EQ Low Frequency	50Hz - 2.0kHz	8-40	table#3	
7	EQ High Frequency	500Hz - 16.0kHz	28-58	table#3	
8					
9					
10					
11					
12					
13					
14					
15	Input Mode	mono/stereo	0-1		
16					

When input mode="mono"

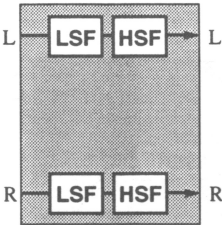


When input mode="stereo"



● 2BAND EQ (STEREO)  
(Variation, Insertion 1, 2 block)

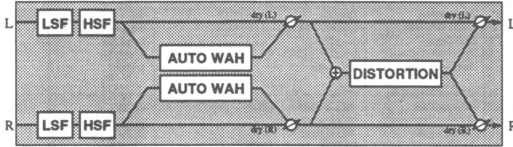
No.	Parameter	Display	Value	See Table	Control
1	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
2	EQ Low Gain	-12 - +12dB	52-76		
3	EQ High Frequency	500Hz - 16.0kHz	28-58	table#3	
4	EQ High Gain	-12 - +12dB	52-76		
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					



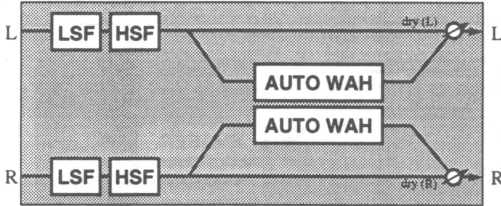
● AUTO WAH (Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz - 39.7Hz	0-127	table#1	
2	LFO Depth	0 - 127	0-127		
3	Cutoff Frequency Offset	0 - 127	0-127		●
4	Resonance	1.0 - 12.0	10-120		
5					
6	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 - +12dB	52-76		
8	EQ High Frequency	500Hz - 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 - +12dB	52-76		
10	Dry/Wet	D63> W - D=W - D<W63	1-127		
11	Drive (Variation block)	0 - 127	0-127		
12					
13					
14					
15					
16					

Variation Block

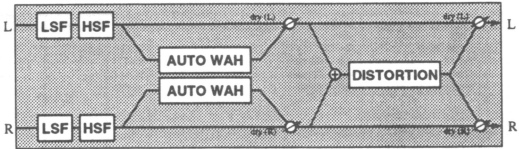


Insertion Block



● AUTO WAH+DIST  
AUTO WAH+ODRV (Variation block)

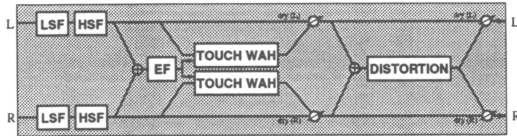
No.	Parameter	Display	Value	See Table	Control
1	LFO Frequency	0.00Hz ~ 39.7Hz	0-127	table#1	●
2	LFO Depth	0 ~ 127	0-127		
3	Cutoff Frequency Offset	0 ~ 127	0-127		
4	Resonance	1.0 ~ 12.0	10-120		
5					
6	EQ Low Frequency	32Hz ~ 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 ~ +12dB	52-76		
8	EQ High Frequency	500Hz ~ 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 ~ +12dB	52-76		
10	Dry/Wet	D63>W ~ D=W ~ D<W63	1-127		
11	Drive	0 ~ 127	0-127		
12	EQ Low Gain(distortion)	-12 ~ +12dB	52-76		
13	EQ Mid Gain(distortion)	-12 ~ +12dB	52-76		
14	LPF Cutoff	1.0kHz ~ thru	34-60	table#3	
15	Output Level	0 ~ 127	0-127		
16					



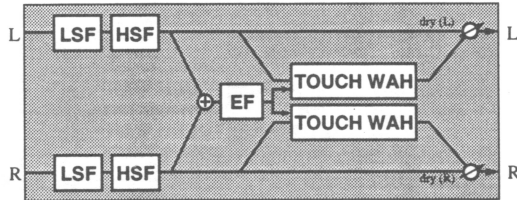
● TOUCH WAH 1  
(Variation, Insertion 1, 2 block)  
TOUCH WAH+DIST (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Sensitive	0 ~ 127	0-127		●
2	Cutoff Frequency Offset	0 ~ 127	0-127		
3	Resonance	1.0 ~ 12.0	10-120		
4					
5					
6	EQ Low Frequency	32Hz ~ 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 ~ +12dB	52-76		
8	EQ High Frequency	500Hz ~ 16.0kHz	28-58	table#3	
9	EQ High Gain	-12 ~ +12dB	52-76		
10	Dry/Wet	D63>W ~ D=W ~ D<W63	1-127		
11	Drive (Variation block)	0 ~ 127	0-127		
12					
13					
14					
15					
16					

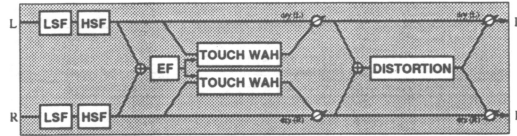
Variation Block: TOUCH WAH 1



Insertion Block: TOUCH WAH 1



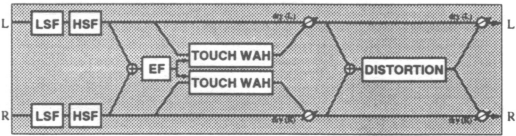
Variation Block: TOUCH WAH+DIST



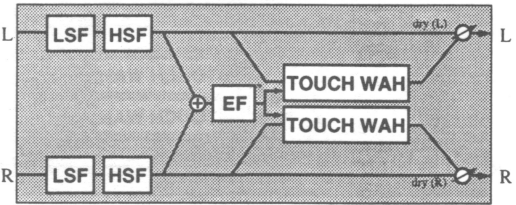
● TOUCH WAH 2  
(Variation, Insertion 1, 2 block)  
TOUCH WAH+ODRV (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Sensitive	0 - 127	0-127		●
2	Cutoff Frequency Offset	0 - 127	0-127		
3	Resonance	1.0 - 12.0	10-120		
4					
5					
6	EQ Low Frequency	32Hz - 2.0kHz	4-40	table#3	
7	EQ Low Gain	-12 ~ +12dB	52-76		
8	EQ High Frequency	500Hz - 16.0kHz	28-56	table#3	
9	EQ High Gain	-12 ~ +12dB	52-76		
10	Dry/Wet	D63>W - D<W63	1-127		
11	Drive	0 - 127	0-127		
12	EQ Low Gain(distortion)	-12 ~ +12dB	52-76		
13	EQ Mid Gain(distortion)	-12 ~ +12dB	52-76		
14	LPF Cutoff	1.0kHz - thru	34-60	table#3	
15	Output Level	0 - 127	0-127		
16	Release	10 - 680ms	52-67		

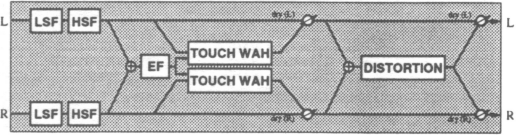
Variation Block: TOUCH WAH 2



Insertion Block: TOUCH WAH 2



Variation Block: TOUCH WAH+ODRV

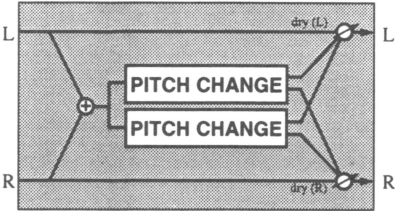


● PITCH CHANGE 1 (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Pitch	-24 ~ +24	40-66		
2	Initial Delay	0 - 127	0-127	table#7	
3	Fine 1	-50 ~ +50	14-114		
4	Fine 2	-50 ~ +50	14-114		
5	Feedback Level	-99 ~ +99%	1-127		
6					
7					
8					
9					
10	Dry/Wet	D63>W - D<W63	1-127		●
11	Pan 1	L63 - R63	1-127		
12	Output Level 1	0 - 127	0-127		
13	Pan 2	L63 - R63	1-127		
14	Output Level 2	0 - 127	0-127		
15					
16					

PITCH CHANGE 2 (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Pitch	-24 ~ +24	40-66		
2	Initial Delay	0 - 127	0-127	table#7	
3	Fine 1	-50 ~ +50cent	14-114		
4	Fine 2	-50 ~ +50cent	14-114		
5	Feedback Level	-99 ~ +99%	1-127		
6					
7					
8					
9					
10	Dry/Wet	D63>W - D<W63	1-127		●
11	Pan 1	L63 - R63	1-127		
12	Output Level 1	0 - 127	0-127		
13	Pan 2	L63 - R63	1-127		
14	Output Level 2	0 - 127	0-127		
15					
16					

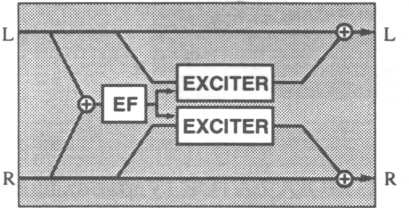


● AURAL EXCITER®  
(Variation, Insertion 1, 2 block)

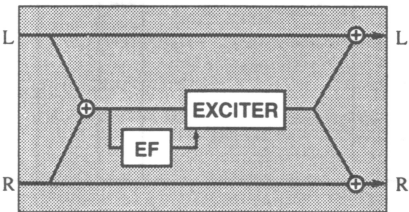
No.	Parameter	Display	Value	See Table	Control
1	HPF Cutoff	500Hz - 16.0kHz	28-58	table#3	●
2	Drive	0 - 127	0-127		
3	Mix Level	0 - 127	0-127		
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Aural Exciter® is a registered trademark of Aphex Corporation.

Variation Block



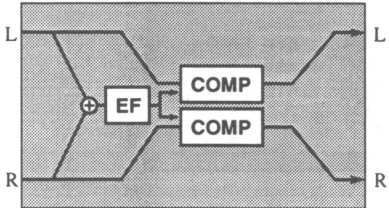
Insertion Block



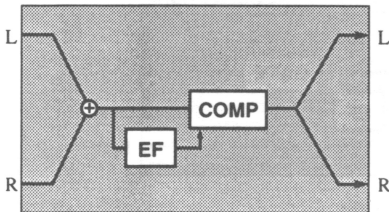
● COMPRESSOR  
(Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Attack	1 - 40ms	0-19	table#8	
2	Release	10 - 680ms	0-15	table#9	
3	Threshold	-48 - -6dB	79-121		
4	Ratio	1.0 - 20.0	0-7	table#10	
5	Output Level	0 - 127	0-127		
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Variation Block



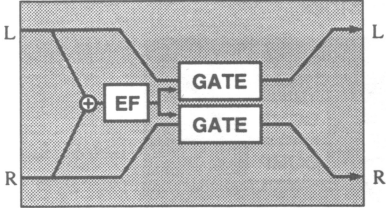
Insertion Block



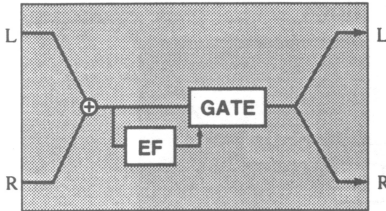
● NOISE GATE (Variation, Insertion 1, 2 block)

No.	Parameter	Display	Value	See Table	Control
1	Attack	1 – 40ms	0-19		
2	Release	10 – 680ms	0-15	table#8	
3	Threshold	-72 – -30dB	55-97	table#9	
4	Output Level	0 – 127	0-127		
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Variation Block

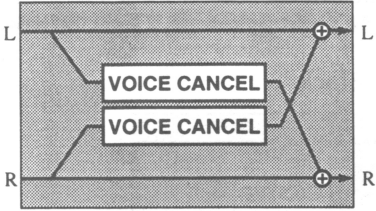


Insertion Block



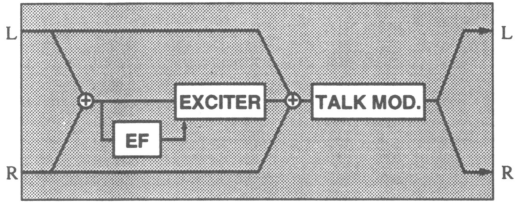
● VOICE CANCEL (Variation block)

No.	Parameter	Display	Value	See Table	Control
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11	Low Adjust	0 – 26	0-26		
12	High Adjust	0 – 26	0-26		
13					
14					
15					
16					



● TALKING MODULATOR (Variation block)

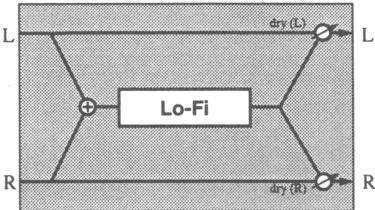
No.	Parameter	Display	Value	See Table	Control
1	Vowel	8, L, U, e, o	0-4		
2	Move speed	1 – 62	1-62		
3	Drive	0 – 127	0-127		
4	Output level	0 – 127	0-127		
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					



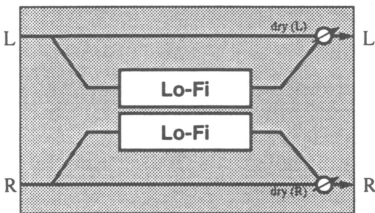
● LO-FI (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	sampling freq control	44.1kHz - 345Hz	0-127		
2	word length	1 - 127	1-127		
3	output gain	-6 ~ +12dB	0-18		
4	LPF Cutoff	63Hz ~ thru	10-60		
5	filter type	Thru,PowerBass,Radio,Telephone,Clean,Low	0-5		
6	LPF resonance	1.0 - 12.0	10-120		
7	bit assign	0 - 6	0-6		
8	emphasis	off/on	0-1		
9					
10	Dry/Wet	D63>W - D<W - D<W63	1-127		●
11					
12					
13					
14	Input Mode	mono/stereo	0-1		
15					
16					

When input mode="mono"

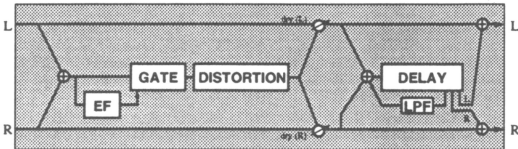


When input mode="stereo"



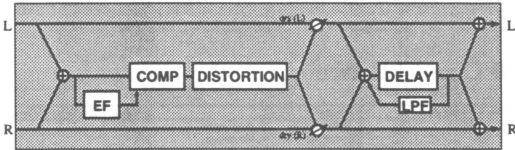
● DIST+DELAY (Variation block)  
OVERDRIVE+DELAY (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Lch Delay Time	0.1 - 1486.0ms	1-14860		
2	Rch Delay Time	0.1 - 1486.0ms	1-14860		
3	Delay Feedback Level	-63 ~ +63	1-127		
4	Delay Mix	0 - 127	0-127		
5	Dist Drive	0 - 127	0-127		
6	Dist Output Level	0 - 127	0-127		
7	Dist EQ Low Gain	-12 ~ +12dB	52-76		
8	Dist EQ Mid Gain	-12 ~ +12dB	52-76		
9					
10	Dry/Wet	D63>W - D<W - D<W63	1-127		●
11					
12					
13					
14					
15					
16					



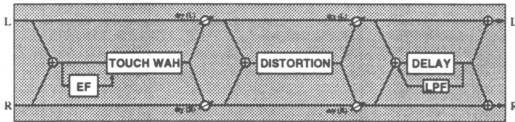
● COMP+DIST+DELAY (Variation block)  
COMP+ODRV+DELAY (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Delay Time	0.1 - 1486.0ms	1-14860		
2	Delay Feedback Level	-63 ~ +63	1-127		
3	Delay Mix	0 - 127	0-127		
4	Dist Drive	0 - 127	0-127		
5	Dist Output Level	0 - 127	0-127		
6	Dist EQ Low Gain	-12 ~ +12dB	52-76		
7	Dist EQ Mid Gain	-12 ~ +12dB	52-76		
8					
9					
10	Dry/Wet	D63>W - D<W - D<W63	1-127		●
11	Comp. Attack	1ms - 40ms	0-19	table#8	
12	Comp. Release	10ms - 680ms	0-15	table#9	
13	Comp. Threshold	-48dB ~ -6dB	76-121		
14	Comp. Ratio	1.0 - 20.0	0-7	table#10	
15					
16					



● WAH+DIST+DELAY (Variation block)  
WAH+ODRV+DELAY (Variation block)

No.	Parameter	Display	Value	See Table	Control
1	Delay Time	0.1 - 1486.0ms	1-14860		
2	Delay Feedback Level	-63 ~ +63	1-127		
3	Delay Mix	0 - 127	0-127		
4	Dist Drive	0 - 127	0-127		
5	Dist Output Level	0 - 127	0-127		
6	Dist EQ Low Gain	-12 ~ +12dB	52-76		
7	Dist EQ Mid Gain	-12 ~ +12dB	52-76		
8					
9					
10	Dry/Wet	D63>W - D<W - D<W63	1-127		●
11	Wah Sensitive	0 - 127	0-127		
12	Wah Cutoff Freq Offset	0 - 127	0-127		
13	Wah Resonance	1.0 - 12.0	10-120		
14	Wah Release	10 - 680ms	52-67		
15					
16					



● Vocoder Harmony

No.	Parameter	Display	Value	See Table	Control
1	Mode	1: no trans, 2: auto trans 3: -3 oct trns, 4: -2 oct trns 5: -1 oct trns, 6: +1 oct trans 7: +2 oct trns, 8: +3 oct trns.	0-7		
2	Harmony Gender Type	off, auto	0-1		
3	Lead Gender Type	off, unis, male, fem.	0-3		
4	Lead Gender Depth	-64 ~ +63	0-127		
5	Lead Pitch Correction	off, on	0-1		
6	Auto Upper Gender Threshold	0 ~ 12	0-12		
7	Auto Lower Gender Threshold	0 ~ 12	0-12		
8	Upper Gender Depth	-64 ~ +63	0-127		
9	Lower Gender Depth	-64 ~ +63	0-127		
10	Lead/Harmony	L63>H ~ (L+H) ~ L<H63	0-127		
11	Vibrato depth	0 ~ 127	0-127		
12	Vibrato rate	0 ~ 127	0-127		
13	Vibrato delay	0 ~ 127	0-127		
14					
15					
16					

● Chromatic Harmony

No.	Parameter	Display	Value	See Table	Control
1	Mode	1: oct below 2: 3rd below 3: 5th below 4: unison 5: 3rd above 6: 5th above 7: oct above	0-6		
2	Harmony Gender Type	off, auto	0-1		
3	Lead Gender Type	off, unis, male, fem.	0-3		
4	Lead Gender Depth	-64 ~ +63 0 ~ 127	64		
5	Lead Pitch Correction	off, on	0-1		
6	Auto Upper Gender Threshold	0 ~ 12	0-12		
7	Auto Lower Gender Threshold	0 ~ 12	0-12		
8	Upper Gender Depth	-64 ~ +63	0-127		
9	Lower Gender Depth	-64 ~ +63	0-127		
10	Lead/Harmony	L63>H ~ (L+H) ~ L<H63	0-127		
11	Vibrato depth	0 ~ 127	0-127		
12	Vibrato rate	0 ~ 127	0-127		
13	Vibrato delay	0 ~ 127	0-127		
14					
15					
16					

● Chordal Harmony

No.	Parameter	Display	Value	See Table	Control
1	Mode	1: duet above 2: duet below 3: duet abv+b 4: trio above 5: trio a&b 6: trio below 7: trio a&b+b 8: quar above 9: quar a&b 10: quar below	0-9		
2	Harmony Gender Type	off, auto	0-1		
3	Lead Gender Type	off, unis, male, fem.	0-3		
4	Lead Gender Depth	-64 ~ +63	0-127		
5	Lead Pitch Correction	off, on	0-1		
6	Auto Upper Gender Threshold	0 ~ 12	0-12		
7	Auto Lower Gender Threshold	0 ~ 12	0-12		
8	Upper Gender Depth	-64 ~ +63	0-127		
9	Lower Gender Depth	-64 ~ +63	0-127		
10	Lead/Harmony	L63>H ~ (L+H) ~ L<H63	0-127		
11	Vibrato depth	0 ~ 127	0-127		
12	Vibrato rate	0 ~ 127	0-127		
13	Vibrato delay	0 ~ 127	0-127		
14					
15					
16					

● Detune Harmony

No.	Parameter	Display	Value	See Table	Control
1	Mode	1: low 2: mid-low 3: mid-high 4: high	0-3		
2					
3	Lead Gender Type	off, unis, male, fem.	0-3		
4	Lead Gender Depth	-64 ~ +63	0-127		
5					
6					
7					
8					
9					
10	Lead/Harmony	L63>H ~ (L+H) ~ L<H63	1-127		
11	Vibrato depth	0 ~ 127	0-127		
12	Vibrato rate	0 ~ 127	0-12		
13	Vibrato delay	0 ~ 127	0-12		
14					
15					
16					

Explanation of effect parameters

Parameter name	Effect types in which the parameter exists	Explanation of parameter
AM Depth	TREMOLO	Depth of volume modulation
AMP Type	AMP SIMULATOR	Select the type of amp to be simulated
Attack	COMPRESSOR type NOISE GATE	Time until the compressor effect begins to apply Time until the gate begins to open
Bit Assign	LO-FI	Adjust the word length of the audio data
Cch Delay	DELAY L,C,R	Length of the center channel delay
Cch Level	DELAY L,C,R	Volume of the center channel
Crossover Frequency	2WAY ROTARY SPEAKER	Crossover frequency between the high-range and low-range speakers
Cutoff Frequency Offset	WAH type	Frequency offset value that will control the wah filter
Delay Mix	DIST+DELAY,OVERDRIVE+DELAY, COMP+DIST+DELAY,COMP+ODRV+DELAY, WAH+DIST+DELAY,WAH+ODRV+DELAY	Mixing amount of delay sound
Delay Offset	CHORUS type	Offset value of delay modulation
Delay Time	KARAOKE1,2,3 AMBIENCE	Spacing of reflections for karaoke echo Delay length
Delay2 Level	ECHO	Volume of second delay
Density	REVERB type, EARLY REF type	Density of reflections. Higher values produce closer spacing
Depth	REVERB type	Depth of the simulated room
Detune	ENSEMBLE DETUNE	Amount of pitch shift
Diffusion	REVERB type, EARLY REF type, PHASER	Control the spaciousness
Drive	DISTORTION type AURAL EXCITER® TALKING MODULATION	Depth of distortion Depth at which the exciter effect is applied Depth at which the exciter effect is applied
Drive High	2WAY ROTARY SPEAKER	Depth of modulation caused by rotation of the low-range speaker
Drive Low	2WAY ROTARY SPEAKER	Depth of modulation caused by rotation of the high-range speaker
Dry/Wet	All types	Balance between dry sound and effect sound
Edge(Clip Curve)	DISTORTION type	Curve of distortion characteristics (sharp(127) distorts suddenly, mild(0) distorts gradually)
Emphasis	LO-FI	Modify the character of the high range
EQ High Frequency	All types	Frequency at which the EQ will boost/cut the high range
EQ High Gain	All types	Gain amount by which the EQ will boost/cut the high range
EQ Low Frequency	All types	Frequency at which the EQ will boost/cut the low range
EQ Low Gain	All types	Gain amount by which the EQ will boost/cut the low range
EQ Mid Frequency	All types	Frequency at which the EQ will boost/cut the mid range
EQ Mid Gain	All types	Gain amount by which the EQ will boost/cut the mid range
EQ Mid Width	All types	Width of the area boosted/cut by the mid-range EQ
Er/Rev Balance	REVERB type	Level balance between the early reflections and the reverberation
F/R Depth	AUTO PAN	Depth of front/back panning (valid when PAN Direction=Lturn,Rturn)
Feedback Delay	DELAY L,C,R	Length of feedback delay
Feedback Delay 1	DELAY L,R	Length of feedback delay 1
Feedback Delay 2	DELAY L,R	Length of feedback delay 2
Feedback Level	REVERB type DELAY type,EARLY REF type,PITCH CHANGE type KARAOKE type CHORUS type, FLANGER type PHASER type	Feedback amount of initial delay Feedback amount Setting for repeated reflections Level at which delay output is again returned to the input (negative values invert the phase) Level at which phaser output is again returned to the input (negative values insert the phase)
Filter Type	LO-FI	Select the type of tonal effect
Fine 1	PITCH CHANGE type	Fine adjustment to pitch of first sound
Fine 2	PITCH CHANGE type	Fine adjustment to pitch of second sound
Height	REVERB type	Height of simulated room
High Adjust	VOICE CANCELAR	Adjust the upper limit of the mid-frequency range that will be attenuated
High Damp	REVERB type,DELAY type,EARLY REF type	Attenuation of the high frequency range (lower values will cause the high range to decay more rapidly)
HPF Cutoff	REVERB type,EARLY REF type,KARAOKE type,AURAL EXCITER®	Frequency at which the high pass filter will cut the low range
Initial Delay	REVERB type EARLY REF type PITCH CHANGE type	Delay time until the early reflections Delay length until ER (GateReverb) sounds Delay length
Input Mode	All types	Mono/stereo switch for input
Input Select	CROSS DELAY	Input select
L/R Depth	AUTO PAN	Depth of left/right panning
L->R Delay	CROSS DELAY	Delay time from left (input) to right (output)
Lch Delay	DELAY type	Length of left channel delay
Lch Delay1	ECHO	Length of first left channel delay
Lch Delay2	ECHO	Length of second left channel delay
Lch Feedback Level	ECHO	Amount of left channel feedback
Lch Init Delay	ENSEMBLE DETUNE	Length of left channel delay
LFO Depth	CHORUS type,FLANGER type,SYMPHONIC ROTARY SPEAKER PHASER type WAH type	Depth of delay modulation Depth of modulation caused by speaker rotation Depth of phase modulation Depth at which the wah filter will be controlled
LFO Frequency	CHORUS type,FLANGER type,SYMPHONIC ROTARY SPEAKER TREMOLO AUTO PAN PHASER type WAH type	Frequency of delay modulation Frequency at which the speaker will rotate Modulation frequency Autopan frequency Phase modulation frequency Frequency at which wah filter will be controlled

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LFO Phase Difference	PHASER type,FLANGER type	L/R phase difference for modulation waveform (0 deg (=64) is no phase difference)
Liveness	EARLY REF type	ER decay. Lower values cause faster decay.
Low Adjust	VOICE CANCEL	Adjust the lower frequency limit of the mid-range that will be attenuated
Low/High	2WAY ROTARY SPEAKER	Volume balance between the high-range and low-range speakers
LPF Cutoff	All types	Frequency at which the low pass filter will cut the high frequency range
LPF Resonance	LO-FI	Add character to the low pass filter of the input
Mic L-R Angle	2WAY ROTARY SPEAKER	L/R angle of the mic that picks up the output
Mix Level	AURAL EXCITER®	Level of the effect sound that is mixed into the dry sound
Move Speed	TALKING MODULATOR	Time over which the sound specified by Vowel is reached
Output Gain	LO-FI	Output gain
Output Level	All types	Output level
Output Level 1	PITCH CHANGE type	Output level for first unit
Output Level 2	PITCH CHANGE type	Output level for second unit
Output Phase	AMBIENCE	Swap phase of the effect sound between L/R
Pan 1	PITCH CHANGE type	Pan of first unit
Pan 2	PITCH CHANGE type	Pan of second unit
PAN Direction	AUTO PAN	Autopan type (L<->R is sine wave, L/R is square wave)
Phase Shift Offset	PHASER type	Offset value for phase modulation
Pitch	PITCH CHANGE type	Pitch setting in semitones
PM Depth	TREMOLO	Depth of delay modulation
R->L Delay	CROSS DELAY	Delay time from right (input) to left (output)
Ratio	COMPRESSOR type	Compression ratio of the compressor
Rch Delay	DELAY type	Length of right channel delay
Rch Delay1	ECHO	Length of first right channel delay
Rch Delay2	ECHO	Length of second right channel delay
Rch Feedback Level	ECHO	Amount of right channel feedback
Rch Init Delay	ENSEMBLE DETUNE	Length of right channel delay
Release	COMPRESSOR type NOISE GATE TOUCH WAH2, TOUCH WAH+ODRV	Time until the sound is released from the compressor effect Time until the gate closes Time until the center frequency of the wah filter returns to normal
Resonance	WAH type	Bandwidth of the wah filter
Rev Delay	REVERB type	Delay time between the early reflections and the reverberation
Reverb Time	REVERB type	Length of reverb
Room Size	EARLY REF type	Size of room. Increasing this value will lengthen ER.
Rotor Speed	2WAY ROTARY SPEAKER	Frequency at which the speaker rotates
Sampling Freq Control	LO-FI	Sampling frequency control
Sensitive	WAH type	Sensitivity with which the wah filter will change in response to changes in the input
Stage	PHASER type	Number of steps for the phase shifter
Threshold	COMPRESSOR type NOISE GATE	Input level at which compression will begin Input level at which the gate will begin to open
Type	EARLY REF type	Type selection
Vowel	TALKING MODULATOR	Vowel selection
Wah Release	WAH+DIST+DELAY,WAH+ODRV+DELAY	Time until the center frequency of the wah filter returns to normal
Wall Vary	REVERB type	Condition of the walls of the simulated room (higher values produce more random reflections)
Width	REVERB type	Width of the simulated room
Word Length	LO-FI	Specify the roughness of the sound

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Additional note: In the preceding pages, indication of effect types such as REVERB-type respectively include the following effect types.

CHORUS type	CHORUS1,CHORUS2,CHORUS3,CHORUS4,CELESTE1,CELESTE2,CELESTE3,CELESTE4
COMPRESSOR type	COMPRESSOR,COMP+DIST, COMP+DIST+DELAY, COMP+OVERDRIVE+DELAY
DELAY type	DELAY L,C,R, DELAY L,R, ECHO, CROSS DELAY, DIST+DELAY, OVERDRIVE+DELAY, COMP+DIST+DELAY, COMP+DIST+DELAY, COMP+OVERDRIVE+DELAY, WAH+DIST+DELAY, WAH+OVERDRIVE+DELAY
DISTORTION type	DISTORTION, OVERDRIVE, AMP SIMULATOR, AUTO WAH+DIST, AUTO WAH+ODRV, TOUCH WAH+DIST, TOUCH WAH+ODRV, COMP+DIST, DIST+DELAY, OVERDRIVE+DELAY, COMP+DIST+DELAY, COMP+OVERDRIVE+DELAY, WAH+DIST+DELAY, WAH+OVERDRIVE+DELAY
EARLY REF type	EARLY REF1, EARLY REF2, GATE REVERB, REVERSE GATE
FLANGER type	FLANGER1,FLANGER2, FLANGER3
KARAOKE type	KARAOKE1, KARAOKE2, KARAOKE3
PHASER type	PHASER1, PHASER2
PITCH CHANGE type	PITCH CHANGE1, PITCH CHANGE2
REVERB type	HALL1,HALL2,ROOM1,ROOM2,ROOM3,STAGE1,STAGE2,PLATE, WHITE ROOM,TUNNEL,CANYON,BASEMENT
WAH type	AUTO WAH, AUTO WAH+DIST, AUTO WAH+ODRV, TOUCH WAH1, TOUCH WAH2, TOUCH WAH+DIST, TOUCH WAH+ODRV, WAH+DIST+DELAY, WAH+OVERDRIVE+DELAY

5. Effect Data Assign Table

Table#1  
LFO Frequency

Data	Value	Data	Value	Data	Value	Data	Value
0	0.00	32	1.34	64	2.69	96	8.41
1	0.08	33	1.43	65	2.77	97	8.74
2	0.08	34	1.43	66	2.86	98	9.08
3	0.16	35	1.51	67	2.94	99	9.42
4	0.16	36	1.51	68	3.02	100	9.75
5	0.25	37	1.59	69	3.11	101	10.0
6	0.25	38	1.59	70	3.19	102	10.7
7	0.33	39	1.68	71	3.28	103	11.4
8	0.33	40	1.68	72	3.36	104	12.1
9	0.42	41	1.76	73	3.44	105	12.7
10	0.42	42	1.76	74	3.53	106	13.4
11	0.50	43	1.85	75	3.61	107	14.1
12	0.50	44	1.85	76	3.70	108	14.8
13	0.58	45	1.93	77	3.86	109	15.4
14	0.58	46	1.93	78	4.03	110	16.1
15	0.67	47	2.01	79	4.20	111	16.8
16	0.67	48	2.01	80	4.37	112	17.4
17	0.75	49	2.10	81	4.54	113	18.1
18	0.75	50	2.10	82	4.71	114	19.5
19	0.84	51	2.18	83	4.87	115	20.8
20	0.84	52	2.18	84	5.04	116	22.2
21	0.92	53	2.27	85	5.21	117	23.5
22	0.92	54	2.27	86	5.38	118	24.8
23	1.00	55	2.35	87	5.55	119	26.2
24	1.00	56	2.35	88	5.72	120	27.5
25	1.09	57	2.43	89	6.05	121	28.9
26	1.09	58	2.43	90	6.39	122	30.2
27	1.17	59	2.52	91	6.72	123	31.6
28	1.17	60	2.52	92	7.06	124	32.9
29	1.26	61	2.60	93	7.40	125	34.3
30	1.26	62	2.60	94	7.73	126	37.0
31	1.34	63	2.69	95	8.07	127	39.7

Table#2  
Modulation Delay Offset

Data	Value	Data	Value	Data	Value	Data	Value
0	0.0	32	3.2	64	6.4	96	9.6
1	0.1	33	3.3	65	6.5	97	9.7
2	0.2	34	3.4	66	6.6	98	9.8
3	0.3	35	3.5	67	6.7	99	9.9
4	0.4	36	3.6	68	6.8	100	10.0
5	0.5	37	3.7	69	6.9	101	11.1
6	0.6	38	3.8	70	7.0	102	12.2
7	0.7	39	3.9	71	7.1	103	13.3
8	0.8	40	4.0	72	7.2	104	14.4
9	0.9	41	4.1	73	7.3	105	15.5
10	1.0	42	4.2	74	7.4	106	17.1
11	1.1	43	4.3	75	7.5	107	18.6
12	1.2	44	4.4	76	7.6	108	20.2
13	1.3	45	4.5	77	7.7	109	21.8
14	1.4	46	4.6	78	7.8	110	23.3
15	1.5	47	4.7	79	7.9	111	24.9
16	1.6	48	4.8	80	8.0	112	26.5
17	1.7	49	4.9	81	8.1	113	28.0
18	1.8	50	5.0	82	8.2	114	29.6
19	1.9	51	5.1	83	8.3	115	31.2
20	2.0	52	5.2	84	8.4	116	32.8
21	2.1	53	5.3	85	8.5	117	34.3
22	2.2	54	5.4	86	8.6	118	35.9
23	2.3	55	5.5	87	8.7	119	37.5
24	2.4	56	5.6	88	8.8	120	39.0
25	2.5	57	5.7	89	8.9	121	40.6
26	2.6	58	5.8	90	9.0	122	42.2
27	2.7	59	5.9	91	9.1	123	43.7
28	2.8	60	6.0	92	9.2	124	45.3
29	2.9	61	6.1	93	9.3	125	46.9
30	3.0	62	6.2	94	9.4	126	48.4
31	3.1	63	6.3	95	9.5	127	50.0

Table#3  
EQ Frequency

Data	Value	Data	Value
0	THRU(20)	32	800
1	22	33	900
2	25	34	1.0k
3	28	35	1.1k
4	32	36	1.2k
5	36	37	1.4k
6	40	38	1.6k
7	45	39	1.8k
8	50	40	2.0k
9	56	41	2.2k
10	63	42	2.5k
11	70	43	2.8k
12	80	44	3.2k
13	90	45	3.6k
14	100	46	4.0k
15	110	47	4.5k
16	125	48	5.0k
17	140	49	5.6k
18	160	50	6.3k
19	180	51	7.0k
20	200	52	8.0k
21	225	53	9.0k
22	250	54	10.0k
23	280	55	11.0k
24	315	56	12.0k
25	355	57	14.0k
26	400	58	16.0k
27	450	59	18.0k
28	500	60	THRU(20.0k)
29	560		
30	630		
31	700		

Table#5  
Delay Time(200.0ms)

Data	Value	Data	Value	Data	Value	Data	Value
0	0.1	32	50.5	64	100.8	96	151.2
1	1.7	33	52.0	65	102.4	97	152.8
2	3.2	34	53.6	66	104.0	98	154.4
3	4.8	35	55.2	67	105.6	99	155.9
4	6.4	36	56.8	68	107.1	100	157.5
5	8.0	37	58.3	69	108.7	101	159.1
6	9.5	38	59.9	70	110.3	102	160.6
7	11.1	39	61.5	71	111.9	103	162.2
8	12.7	40	63.1	72	113.4	104	163.8
9	14.3	41	64.6	73	115.0	105	165.4
10	15.8	42	66.2	74	116.6	106	166.9
11	17.4	43	67.8	75	118.2	107	168.5
12	19.0	44	69.4	76	119.7	108	170.1
13	20.6	45	70.9	77	121.3	109	171.7
14	22.1	46	72.5	78	122.9	110	173.2
15	23.7	47	74.1	79	124.4	111	174.8
16	25.3	48	75.7	80	126.0	112	176.4
17	26.9	49	77.2	81	127.6	113	178.0
18	28.4	50	78.8	82	129.2	114	179.5
19	30.0	51	80.4	83	130.7	115	181.1
20	31.6	52	81.9	84	132.3	116	182.7
21	33.2	53	83.5	85	133.9	117	184.3
22	34.7	54	85.1	86	135.5	118	185.8
23	36.3	55	86.7	87	137.0	119	187.4
24	37.9	56	88.2	88	138.6	120	189.0
25	39.5	57	89.8	89	140.2	121	190.6
26	41.0	58	91.4	90	141.8	122	192.1
27	42.6	59	93.0	91	143.3	123	193.7
28	44.2	60	94.5	92	144.9	124	195.3
29	45.7	61	96.1	93	146.5	125	196.9
30	47.3	62	97.7	94	148.1	126	198.4
31	48.9	63	99.3	95	149.6	127	200.0

Table#4  
Reverb time

Data	Value	Data	Value	Data	Value
0	0.3	32	3.5	64	17.0
1	0.4	33	3.6	65	18.0
2	0.5	34	3.7	66	19.0
3	0.6	35	3.8	67	20.0
4	0.7	36	3.9	68	25.0
5	0.8	37	4.0	69	30.0
6	0.9	38	4.1		
7	1.0	39	4.2		
8	1.1	40	4.3		
9	1.2	41	4.4		
10	1.3	42	4.5		
11	1.4	43	4.6		
12	1.5	44	4.7		
13	1.6	45	4.8		
14	1.7	46	4.9		
15	1.8	47	5.0		
16	1.9	48	5.5		
17	2.0	49	6.0		
18	2.1	50	6.5		
19	2.2	51	7.0		
20	2.3	52	7.5		
21	2.4	53	8.0		
22	2.5	54	8.5		
23	2.6	55	9.0		
24	2.7	56	9.5		
25	2.8	57	10.0		
26	2.9	58	11.0		
27	3.0	59	12.0		
28	3.1	60	13.0		
29	3.2	61	14.0		
30	3.3	62	15.0		
31	3.4	63	16.0		

Table#6  
Room Size

Data	Value	Data	Value
0	0.1	32	5.1
1	0.3	33	5.3
2	0.4	34	5.4
3	0.6	35	5.6
4	0.7	36	5.7
5	0.9	37	5.9
6	1.0	38	6.1
7	1.2	39	6.2
8	1.4	40	6.4
9	1.5	41	6.5
10	1.7	42	6.7
11	1.8	43	6.8
12	2.0	44	7.0
13	2.1		
14	2.3		
15	2.5		
16	2.6		
17	2.8		
18	2.9		
19	3.1		
20	3.2		
21	3.4		
22	3.5		
23	3.7		
24	3.9		
25	4.0		
26	4.2		
27	4.3		
28	4.5		
29	4.6		
30	4.8		
31	5.0		

Table#7  
Delay Time (400.0ms)

Data	Value	Data	Value	Data	Value	Data	Value
0	0.1	32	100.9	64	201.6	96	302.4
1	3.2	33	104.0	65	204.8	97	305.5
2	6.4	34	107.2	66	207.9	98	308.7
3	9.5	35	110.3	67	211.1	99	311.8
4	12.7	36	113.5	68	214.2	100	315.0
5	15.8	37	116.6	69	217.4	101	318.1
6	19.0	38	119.8	70	220.5	102	321.3
7	22.1	39	122.9	71	223.7	103	324.4
8	25.3	40	126.1	72	226.8	104	327.6
9	28.4	41	129.2	73	230.0	105	330.7
10	31.6	42	132.4	74	233.1	106	333.9
11	34.7	43	135.5	75	236.3	107	337.0
12	37.9	44	138.6	76	239.4	108	340.2
13	41.0	45	141.8	77	242.6	109	343.3
14	44.2	46	144.9	78	245.7	110	346.5
15	47.3	47	148.1	79	248.9	111	349.6
16	50.5	48	151.2	80	252.0	112	352.8
17	53.6	49	154.4	81	255.2	113	355.9
18	56.8	50	157.5	82	258.3	114	359.1
19	59.9	51	160.7	83	261.5	115	362.2
20	63.1	52	163.8	84	264.6	116	365.4
21	66.2	53	167.0	85	267.7	117	368.5
22	69.4	54	170.1	86	270.9	118	371.7
23	72.5	55	173.3	87	274.0	119	374.8
24	75.7	56	176.4	88	277.2	120	378.0
25	78.8	57	179.6	89	280.3	121	381.1
26	82.0	58	182.7	90	283.5	122	384.3
27	85.1	59	185.9	91	286.6	123	387.4
28	88.3	60	189.0	92	289.8	124	390.6
29	91.4	61	192.2	93	292.9	125	393.7
30	94.6	62	195.3	94	296.1	126	396.9
31	97.7	63	198.5	95	299.2	127	400.0

Table#11  
Reverb Width; Depth; Height

Data	Value	Data	Value	Data	Value	Data	Value
0	0.5	32	8.8	64	17.6	96	27.5
1	0.8	33	9.1	65	17.9	97	27.8
2	1.0	34	9.4	66	18.2	98	28.1
3	1.3	35	9.6	67	18.5	99	28.5
4	1.5	36	9.9	68	18.8	100	28.8
5	1.8	37	10.2	69	19.1	101	29.2
6	2.0	38	10.4	70	19.4	102	29.5
7	2.3	39	10.7	71	19.7	103	29.9
8	2.6	40	11.0	72	20.0	104	30.2
9	2.8	41	11.2	73	20.2		
10	3.1	42	11.5	74	20.5		
11	3.3	43	11.8	75	20.8		
12	3.6	44	12.1	76	21.1		
13	3.9	45	12.3	77	21.4		
14	4.1	46	12.6	78	21.7		
15	4.4	47	12.9	79	22.0		
16	4.6	48	13.1	80	22.4		
17	4.9	49	13.4	81	22.7		
18	5.2	50	13.7	82	23.0		
19	5.4	51	14.0	83	23.3		
20	5.7	52	14.2	84	23.6		
21	5.9	53	14.5	85	23.9		
22	6.2	54	14.8	86	24.2		
23	6.5	55	15.1	87	24.5		
24	6.7	56	15.4	88	24.9		
25	7.0	57	15.6	89	25.2		
26	7.2	58	15.9	90	25.5		
27	7.5	59	16.2	91	25.8		
28	7.8	60	16.5	92	26.1		
29	8.0	61	16.8	93	26.5		
30	8.3	62	17.1	94	26.8		
31	8.6	63	17.3	95	27.1		

Table#8  
Compressor Attack Time

Data	Value
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8
8	9
9	10
10	12
11	14
12	16
13	18
14	20
15	23
16	26
17	30
18	35
19	40

Table#9  
Compressor Release Time

Data	Value
0	10
1	15
2	25
3	35
4	45
5	55
6	65
7	75
8	85
9	100
10	115
11	140
12	170
13	230
14	340
15	680

Table#10  
Compressor Ratio

Data	Value
0	1.0
1	1.5
2	2.0
3	3.0
4	5.0
5	7.0
6	10.0
7	20.0

MIDI DATA FORMAT (MIDIデータフォーマット)

1. Channel messages

1.1 Note on/note off

These messages convey keyboard performance data.  
Note-on is transmitted when a note is pressed, and note-off is transmitted when a note is released.  
These messages contain a "note number" which indicates the key that was played, and a "velocity" which indicates how strongly it was played.  
When a note-on of velocity "0" is received, it has the same effect as a note-off.  
Range of note numbers received = 0 (C-2)...60 (C3)...127 (G8)  
Velocity range = 1...127 (Velocity is received only for note-on)  
When the Multi Part parameter "Rcv NOTE MESSAGE" = OFF, that part will not receive these messages.  
For a drum part\*, key-off is not received if the DrumSetup parameter Rcv NOTE OFF = OFF.  
For a drum part, key-on is not received if the DrumSetup parameter Rcv NOTE ON = OFF.  
\* Drum Part indicates that the Multi Part parameter PART MODE is "set to DRUM or DRUMS1...4."

1.2 Control changes

These messages control volume or pan etc.  
Their functions are differentiated by the control number (Ctrl#).  
If the Multi Part parameter Rcv CONTROL CHANGE = OFF, that part will not receive control changes.

1.2.1 Bank Select

This voice selects the voice bank.  
The voice bank is selected by the combination of two control change messages: MSB and LSB.  
The function of the MSB and LSB will differ depending on the sound module mode.  
In the case of "XG," the MSB value will specify the major division of voices, and the LSB value will specify the detailed division.  
In the case of "TG300B," the LSB value is fixed, and only the MSB value will specify the detailed voice division.  
In the case of "C/M," Bank Select is not received.

Control#	Parameter	Data Range
0	Bank Select MSB	0...127
32	Bank Select LSB	0...127

The Bank Select data will be processed only after a Program Change is received, and then voice bank will change at that time.  
If you wish to change the voice bank as well as the voice, you must transmit Bank Select and Program Change messages as a set, in the order of Bank Select MSB, LSB, and Program Change.

1.2.2 Modulation

This message is used primarily to control the depth of vibrato, but the depth of the following 7 types of effect can be controlled.  
The effect of this message can be changed by the following parameters.  
• Multi Part Parameter  
1. MW PITCH CONTROL  
2. MW FILTER CONTROL  
3. MW AMPLITUDE CONTROL  
4. MW LFO PMOD DEPTH  
5. MW LFO FMOD DEPTH  
6. MW LFO AMOD DEPTH  
• Effect1 Parameter  
7. MW VARIATION CONTROL DEPTH  
(Valid when Variation Effect is assigned to a part as Insertion)  
By default, an LFO Pitch Modulation (PMOD) effect will apply.

Control#	Parameter	Data Range
1	Modulation	0...127

If the Multi Part parameter Rcv MODULATION = OFF, that part will not receive Modulation.  
If the receive channel is a drum part, effects 5 and 6 will not apply.

1.2.3 Breath Controller

Control#	Parameter	Data Range
2	Breath Controller	0...127

Valid only when a VL sound is selected.

1.2.4 Foot Controller

Control#	Parameter	Data Range
4	Foot Controller	0...127

Valid only when a VL sound is selected.

1.2.5 Portamento Time

This message controls the degree of Portamento (refer to 1.2.11).  
Control# Parameter Data Range  
5 Portamento Time 0...127

When Portamento (control number 065) is ON, this regulates the speed of the pitch change.  
A value of 0 is the shortest portamento time, and 127 is the longest portamento time.  
If the receive channel is a drum part, Portamento Time is not received.

1.2.6 Data Entry

This message sets the value of the parameter which was specified by RPN MSB/LSB (see 1.2.22) and NRPN MSB/LSB (see 1.2.21).

Control#	Parameter	Data Range
6	Data Entry MSB	0...127
38	Data Entry LSB	0...127

1.2.7 Main Volume

This message controls the volume of each part.  
This is used to adjust the volume balance between parts.

Control#	Parameter	Data Range
7	Main Volume	0...127

When the Multi Part parameter Rcv VOLUME = OFF, that part will not receive Main Volume.  
With a value of 0 there will be no sound, and a value of 127 will be the maximum volume.

1.2.8 Panpot

This message control the panning (stereo location) of each part.  
This will be the location of the sound when heard in stereo.

Control#	Parameter	Data Range
10	Pan	0...64...127

When the Multi Part parameter Rcv PAN = OFF, that part will not receive Panpot.  
0 is left, 64 is center, and 127 is right.

1.2.9 Expression

This message controls expression (dynamics within a musical line) for each part.  
It is used to create volume changes during a song.

Control#	Parameter	Data Range
11	Expression	0...127

If the Multi Part parameter Rcv EXPRESSION = OFF, that part will not receive Expression.  
With a value of 0 there will be no sound, and with a value of 127 the volume will be maximum.

1.2.10 Control Change13

Control#	Parameter	Data Range
13	Control Change13	0...127

Valid only when a VL sound is selected.

1.2.11 Hold1

This message controls sustain pedal on/off.  
The notes that are sounding while the pedal is pressed will be sustained.

Control#	Parameter	Data Range
64	Hold1	0...63,64...127 (OFF, ON)

For data of 0...63 the sustain pedal will be OFF (released), and for data of 64...127 it will be on (pressed).  
When this is ON, currently-sounding notes will continue to sound even if note-off messages are received.  
If the Multi Part parameter Rcv HOLD1 = OFF, that part will not receive Hold1.

1.2.12 Portamento

This message controls portamento on/off.  
When the pedal is pressed, a portamento effect will be applied.

Control#	Parameter	Data Range
65	Portamento	0...63, 64...127 (OFF, ON)

For data of 0...63 the portamento pedal will be OFF (released), and for 64...127 it will be ON (pressed).  
When this is ON, the pitch will change smoothly between notes. The time over which the pitch changes is adjusted by Portamento Time (see 1.2.3). Also, when the Multi Part parameter MONO/POLY MODE = MONO, the tone will also change smoothly (legato) if Portamento = ON.  
If any of the following Multi Part parameter settings apply, that part will not receive Portamento.  
• Rcv PORTAMENTO = OFF  
• PART MODE = DRUM, DRUMS1...4

1.2.13 Sostenuto

This message controls sostenuto pedal on/off.  
Notes which were already pressed when the pedal was pressed will be sustained.

Control#	Parameter	Data Range
66	Sostenuto	0...63,64...127 (OFF, ON)

For data of 0...63, the sostenuto pedal will be OFF (released), and for 64...127 it will be ON (pressed).  
If sostenuto is turned on while a note is sounding, that note will be sustained until sostenuto is turned OFF.  
If the Multi Part parameter Rcv SOSTENUTO = OFF, that part will not receive Sostenuto.  
Has no effect on VL sounds.

1.2.14 Soft Pedal

This message controls soft pedal on/off.  
The sound will become more mellow while the pedal is pressed.

Control#	Parameter	Data Range
67	Soft Pedal	0...63, 64...127 (OFF, ON)

For data of 0...63, the soft pedal is OFF (released), and for 64...127 it is ON (pressed).  
If any of the following Multi Part parameter settings apply, that part will not receive the Soft Pedal.  
• Rcv SOFT PEDAL = OFF  
• PART MODE = DRUM, DRUM1...4

1.2.15 Harmonic Content

This message adjusts the resonance of the filter that is specified for the sound.  
The value of 0~127 is taken as -64~+63, and added as an offset value to the original sound data to modify the resonance.

Control#	Parameter	Data Range
71	Harmonic Content	0...64...127 (-64...0...+63)

Since this is a relative change parameter, it specifies a boost or cut relative to 64.  
Higher values will produce a more distinctive sound.  
For some sounds, the effective range may be less than the possible range of settings.

1.2.16 Release Time

This message adjusts the EG release time that was specified by the sound data.  
The value of 0~127 is taken as -64~+63, and added to the original sound data as an offset value to modify the release time.

Control#	Parameter	Data Range
72	Release Time	0...64...127 (-64...0...+63)

Since this is a relative change parameter, it specifies an increase or decrease relative to 64.  
Increasing this value will lengthen the release that follows a note-off.

1.2.17 Attack Time

This message adjusts the EG attack time that was specified by the sound data.  
The value of 0~127 is taken as -64~+63, and added to the original sound data as an offset value to modify the attack time.

Control#	Parameter	Data Range
73	Attack Time	0...64...127 (-64...0...+63)

Since this a relative change parameter, it specifies an increase or decrease relative to 64.  
Increasing this value will make the attack more gradual, and decreasing this value will make the attack sharper.

1.2.18 Brightness

This message adjusts the cutoff frequency of the low pass filter specified by the sound data.  
The value of 0~127 is taken as -64~+63, and added to the original sound data as an offset value to modify the cutoff frequency.

Control#	Parameter	Data Range
74	Brightness	0...64...127 (-64...0...+63)

Since this is a relative change parameter, it specifies an increase or decrease relative to 64.  
Lower values will produce a more mellow sound.  
For some sounds, the effective range may be less than the possible range of settings.

1.2.19 Portamento Control

This message specifies the portamento source key number (the key number at which portamento will begin).  
Data of 0...127 specifies the portamento source key.  
When Portamento Control is received, the currently-sounding pitch will change at a Portamento Time of 0 to the key of the next-received note-on of the same channel.

Control#	Parameter	Data Range
84	Portamento Control	0...127 (C-2...G8)

This is received even if Rcv PORTAMENTO = OFF.  
Has no effect on VL sounds.

1.2.20 Effect1 Depth(Reverb Send Level)

This message specifies the send level for the reverb effect.

Control#	Parameter	Data Range
91	Effect1 Depth	0...127

Increasing this value will produce a richer reverb. The effect of the value will depend on the state of the reverb effect.

1.2.21 Effect3 Depth(Chorus Send Level)

This message specifies the send level for the chorus effect.

Control#	Parameter	Data Range
93	Effect3 Depth	0...127

Raising this value will increase the modulation or spaciousness. The effect of the value will depend on the state of the chorus effect.

1.2.22 Effect4 Depth (Variation Effect Send Level)

This message specifies the send level for the variation effect.

Control#	Parameter	Data Range
94	Effect4 Depth	0...127

However, this is not received if the Variation Effect parameter Variation Connection = 0 (Insertion).

1.2.23 Data Increment/Decrement (for RPN)

After RPN (see 1.2.22) is used to specify a parameter such as Pitch Bend Sensitivity, Fine Tune, or Coarse Tune, this message is used to increment or decrement the respective parameter value in steps of 1.

Control#	Parameter	Data Range
96	RPN Increment	--
97	RPN Decrement	--

The data byte is ignored.

1.2.24 NRPN (Non-registered parameter number)

This message is used to specify a sound parameter (such as vibrato, filter, EG, drum setup etc.) as an offset value. Use NRPN MSB and NRPN LSB to specify the parameter that you wish to modify, and then use Data Entry (see 1.2.4) to set the value for the specified parameter.

Control#	Parameter	Data Range
98	NRPN LSB	0...127
99	NRPN MSB	0...127

If the Multi Part parameter Rcv NRPN = OFF, that part will not receive NRPN.

The following NRPN messages can be received.

NRPN MSB  LSB		Data Entry *1 MSB  LSB		Parameter name and value range
01	08	mm	-- *2	Vibrato rate mm: 00 - 64 - 127 (-64...0...+63)
01	09	mm	--	Vibrato depth mm: 00 - 64 - 127 (-64...0...+63)
01	10	mm	-- *3	Vibrato delay mm: 00 - 64 - 127 (-64...0...+63)
01	32	mm	--	Low pass filter cutoff frequency mm: 00 - 64 - 127 (-64...0...+63)
01	33	mm	--	Low pass filter resonance mm : 00 - 64 - 127 (-64...0...+63)
01	34	mm	--	Filter EG Depth (VL sounds only) mm : 00 - 64 - 127 (-64...0...+63)
01	36	mm	--	High pass filter cutoff frequency (Has no effect on VL sounds) mm: 00 - 64 - 127 (-64...0...+63)
01	48	mm	-- *4	EQ bass gain mm: 00 - 64 - 127 (-64...0...+63)
01	49	mm	-- *4	EQ treble gain mm: 00 - 64 - 127 (-64...0...+63)
01	52	mm	-- *4	EQ bass frequency (Has no effect on VL sounds) mm: 04 - 40 (32...2.0k [Hz])
01	53	mm	-- *4	EQ treble frequency (Has no effect on VL sounds) mm: 28 - 58 (500...16.0k [Hz])
01	99	mm	--	EG attack time mm: 00 - 64 - 127 (-64...0...+63)
01	100	mm	--	EG decay time mm: 00 - 64 - 127 (-64...0...+63)
01	102	mm	--	EG release time mm: 00 - 64 - 127 (-64...0...+63)
20	rr	mm	--	Drum low pass filter cutoff frequency rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
21	rr	mm	--	Drum low pass filter resonance rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
22	rr	mm	--	Drum EG attack rate rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
23	rr	mm	--	Drum EG decay rate rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63) The effect will apply both to Decay 1 and 2.
24	rr	mm	--	Drum instrument pitch coarse rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
25	rr	mm	--	Drum instrument pitch fine rr: drum instrument note number mm: 00 - 64 - 127 (-64...0...+63)
26	rr	mm	--	Drum instrument level rr: drum instrument note number mm: 00 - 127(0...maximum)
28	rr	mm	--	Drum instrument panpot rr: drum instrument note number mm: 00, 01-64-127(RND, L63...C...R63)
29	rr	mm	--	Drum instrument reverb send level rr: drum instrument note number mm: 00 - 127(0...maximum)



30	rr	mm	--	Drum instrument chorus send level rr: drum instrument note number mm: 00 - 127(0...maximum)
31	rr	mm	--	Drum instrument variation send level rr: drum instrument note number mm: 00 - 127(0...maximum) (when Variation Connection = SYSTEM)) mm: 00, 01-127 (OFF,ON) (when Variation Connection = INSERTION))
36	rr	mm	--	Drum high pass filter cutoff frequency mm: 00 - 64 - 127 (-64...0...+63)
48	rr	mm	--	Drum EQ bass gain mm: 00 - 64 - 127 (-64...0...+63)
49	rr	mm	--	Drum EQ treble gain mm: 00 - 64 - 127 (-64...0...+63)
52	rr	mm	--	Drum EQ bass frequency mm: 04 - 40(32...2.0k [Hz])
53	rr	mm	--	Drum EQ treble frequency mm: 28 - 58(500...16.0k [Hz])

MSB 14H-35H (for drums) is received when Multi Part parameter PART MODE = DRUMS1...4.

- \*1 Refer to 1.2.4
- \*2 '--' indicates that the setting value is ignored.
- \*3 Adjusts the time after the note is played until vibrato begins to take effect. The effect will begin more quickly for higher values, and more slowly for higher values. No effect if Bank Select MSB=127 is selected.
- \*4 No effect if Multi Part parameter PART MODE = DRUM, DRUMS1...4.

1.2.25 RPN (Registered parameter number)

This message is used to specify part parameters such as Pitch Bend Sensitivity or Tuning etc. as an offset value. Use RPN MSB and RPN LSB to specify the parameter that you wish to modify, and then use Data Entry (see 1.2.4) to set the value of the specified parameter.

Control#	Parameter	Data Range
100	RPN LSB	0...127
101	RPN MSB	0...127

If the Multi Part parameter Rcv RPN = OFF, that part will not receive this message.

The following RPN messages can be received.

RPN		Data Entry*1		Parameter name and value range
MSB	LSB	MSB	LSB	
00	00	mm	-- *2	Pitch bend sensitivity mm: 00-24 (0...+24 semitones) Specify up to 2 octaves in semitone steps
00	01	mm	ll	Fine tuning mm ll: 00 00 -100 cents :       : mm ll: 64 00 0 cents :       : mm ll: 127 127 +100 cents [Note] mm ll: 00 127 (=-87.5) cents is followed by 01 00 (=-87.4) cents.
00	02	mm	--	Coarse tuning mm: 40 - 64 - 88 (-24...0...+24 semitones)
127	127	--	--	RPN Null This sets RPN and NRPN numbers to an unset state. Internal data is not affected.

- \*1 Refer to 1.2.4
- \*2 '--' indicates that the setting value is ignored.

1.2.26 Assignable controller

By assigning a control change number of 0...95 to a part, the specified effect can be controlled. This device allows two control change numbers (AC1 and AC2) to be specified for each part. The following parameters specify the effect of AC1 and AC2.

- Multi Part Parameter
  1. AC1, AC2 PITCH CONTROL
  2. AC1, AC2 FILTER CONTROL
  3. AC1, AC2 AMPLITUDE CONTROL
  4. AC1, AC2 LFO PMOD DEPTH
  5. AC1, AC2 LFO FMOD DEPTH
  6. AC1, AC2 LFO AMOD DEPTH
- Effect1 Parameter
  7. AC1, AC2 VARIATION CONTROL DEPTH(Valid if Variation Effect is assigned to a part as Insertion)

The AC1 control change number is specified by the Multi Part or A/D Part parameter AC1 CONTROLLER NUMBER, and the AC2 control change number is specified by the Multi Part or A/D Part parameter AC2 CONTROLLER NUMBER.

1.3 Channel mode messages

These messages specify the basic operation of a part.

1.3.1 All Sound Off

This message silences all currently-sounding notes on the corresponding channel. However, the state of channel messages such as Note-on and Hold-on will be maintained.

Control#	Parameter	Data Range
120	All Sound Off	0

1.3.2 Reset All Controllers

This message resets the following controllers to their default values.

Controller	Value
Pitch bend change	±0 (center)
Channel pressure	0 (off)
Polyphonic key pressure	0 (off)
Modulation	0 (off)
Breath control	127 (maximum)
Foot control	127 (maximum)
Expression	127 (maximum)
Control change13	±0 (center)
Hold	0 (off)
Portamento	0 (off)
Sostenuto	0 (off)
Soft pedal	0 (off)
Portamento control	Reset the portamento source note number that was received
RPN	Number unset, internal data is not affected.
NRPN	Number unset, internal data is not affected.

The following data is not changed  
Parameter values specified by program change, bank select MSB/LSB, volume, pan, effect send levels 1, 3, 4, RPN and NRPN.

Control#	Parameter	Data Range
121	Reset All Controllers	0

1.3.3 All Note Off

This message turns off all notes which are currently on for the corresponding part.  
However, if Hold 1 or Sostenuto are on, notes will continue to sound until these are turned off.

Control#	Parameter	Data Range
123	All Note Off	0

1.3.4 Omni Off

Perform the same processing as when All Note Off is received.

Control#	Parameter	Data Range
124	Omni Off	0

1.3.5 Omni On

Perform the same processing as when All Note Off is received.

Control#	Parameter	Data Range
125	Omni On	0

1.3.6 Mono

Perform the same processing as when All Sound Off is received, and if the value (mono number) is in the range of 0...16, set the corresponding channel to Mode4\* (m = 1).

Control#	Parameter	Data Range
126	Mono	0...16

\* Mode4 is a state in which only channel messages on the specified channel will be received, and notes will be sounded individually (monophonically).

1.3.7 Poly

Perform the same processing as when All Sound Off is received, and set the corresponding channel to Mode3\*

Control#	Parameter	Data Range
127	Poly	0

\* Mode3 is when channel messages will be received only on the specified channel, and will be sounded polyphonically.

1.4 Program change

This message is used to select voices or performances.  
When this is transmitted in conjunction with Bank Select (see 1.2.1), voices and performances can be selected not only from the basic voice bank but also from the extended voice bank and from internal performances.  
If the Multi Part parameter Rcv PROGRAM CHANGE = OFF, that part will not receive program changes.  
If Sound Module Mode = C/M, program changes for the Drum Part will not be received.

1.5 Pitch bend

This message conveys movements of the pitch bender.  
This message is generally used to modify the pitch of a part, but the depth of the following seven effects can be controlled.  
The effect of this message can be modified by the following parameters.

- Multi Part Parameter
  1. BEND PITCH CONTROL
  2. BEND FILTER CONTROL
  3. BEND AMPLITUDE CONTROL
  4. BEND LFO PMOD DEPTH
  5. BEND LFO FMOD DEPTH
  6. BEND LFO AMOD DEPTH
- Effect1 Parameter
  7. BEND VARIATION CONTROL DEPTH(Valid when Variation Effect is assigned to a part as Insertion)

By default, the Pitch Control effect is applied.  
If the receive channel is a drum part, effects 5 and 6 will not apply.  
If the Multi Part parameter Rcv PITCH BEND CHANGE = OFF, that part will not receive pitch bend messages.

1.6 Channel aftertouch

This message conveys the pressure which is applied to the keyboard after playing a note in order to create tonal changes (for an entire MIDI channel). The pressure can be controlled for each part. This message will affect the currently-sounding notes.  
The effect of this message will be determined by the settings of the following parameters.

- Multi Part Parameter
  1. CAT PITCH CONTROL
  2. CAT FILTER CONTROL
  3. CAT AMPLITUDE CONTROL
  4. CAT LFO PMOD DEPTH
  5. CAT LFO FMOD DEPTH
  6. CAT LFO AMOD DEPTH
- Effect1 Parameter
  7. CAT VARIATION CONTROL DEPTH(Valid when the Variation Effect is assigned to a part as Insertion)

By default, there will be no effect.  
If the receive channel is a drum part, effects 5 and 6 will not apply.  
If the Multi Part parameter Rcv CHANNEL AFTER TOUCH = OFF, that part will not receive Channel Aftertouch.

1.7 Polyphonic aftertouch

This message conveys the pressure that is applied to the keyboard after playing a note (for individual note numbers).  
The pressure can be controlled independently for each note. This message will affect currently-sounding notes.  
The effect of this message is determined by the following Multi Part parameters.

1. PAT PITCH CONTROL
2. PAT FILTER CONTROL
3. PAT AMPLITUDE CONTROL
4. PAT LFO PMOD DEPTH
5. PAT LFO FMOD DEPTH
6. PAT LFO AMOD DEPTH

By default, there will be no effect.  
The effect will apply to note numbers 36...97.  
In the case of either of the following Multi Part parameter settings, that part will not receive Polyphonic Aftertouch.  
Rcv CHANNEL AFTER TOUCH = OFF  
PART MODE = DRUM, DRUMS1...4

2. System exclusive messages

These MIDI messages are not directly "performance data," but are used to make settings related to the system of the MIDI device.  
For example, these messages can be used to save data specific to this device on a MIDI data filer such as the MDF2, or to exchange data between two or more MU100R units.  
By using these messages, it is possible to edit virtually all settings of the MU100R from an external MIDI device.  
However, data cannot be exchanged unless the receiving and transmitting devices are set to the same Device Number.

2.1 Parameter changes

This devices uses the following parameter changes.

[UNIVERSAL REALTIME MESSAGE]  
1) Master Volume

[UNIVERSAL NON REALTIME MESSAGE]  
1) General MIDI System On  
2) Identity Request(INQUIRY MESSAGE)  
3) Identity Reply(INQUIRY MESSAGE)

[XG PARAMETER CHANGE]  
1) XG System on  
2) XG System parameter change  
3) Multi Effect1 parameter change  
4) Multi EQ parameter change  
5) Multi Effect2 parameter change  
6) Unique Effect parameter change  
7) Display parameter change  
8) Multi Part parameter change  
9) AD Part parameter change  
10) AD System parameter change  
11) Drums Setup parameter change  
12) Part Assign parameter change

[MU100 NATIVE PARAMETER CHANGE 1]  
1) System parameter change  
2) Remote switch

[MU100 NATIVE PARAMETER CHANGE 2]  
1) Current Performance parameter change

[VL70-m NATIVE PARAMETER CHANGE]  
1) VL System parameter change  
2) VL Current Voice/Common Misc parameter change  
3) VL Part parameter change  
4) VL Current Voice/Element parameter change

[Others]  
1) Master tuning  
2) TG300 System parameter change  
3) TG300 Multi Effect parameter change  
4) TG300 Multi Part parameter change

2.1.1 Universal realtime messages

2.1.1.1 Master Volume

This system exclusive message is used to control the volume of all channels simultaneously.

11110000	F0H	= Exclusive status
01111111	7FH	= Universal Real Time
01111111	7FH	= ID of target device
00000100	04H	= Sub-ID #1 = Device Control Message
00000001	01H	= Sub-ID #2 = Master Volume
* 0sssssss	SSH	= Volume LSB
0ttttttt	TTH	= Volume MSB
11110111	F7H	= End of Exclusive
or,		
11110000	F0H	= Exclusive status
01111111	7FH	= Universal Real Time
0xxxxnnnn	XNH	= Device Number, xxx = don't care

00000100	04H	= Sub-ID #1 = Device Control Message
00000001	01H	= Sub-ID #2 = Master Volume
0sssssss	SSH	= Volume LSB
0ttttttt	TTH	= Volume MSB
11110111	F7H	= End of Exclusive

When this is received, the Volume MSB will be reflected by the System parameter MASTER VOLUME.

\* The binary expression 0sssssss is expressed in hexadecimal as SSH.

The same applies elsewhere.

2.1.2 Universal non-realtime messages

2.1.2.1 General MIDI System On

This system exclusive message causes the MU100R to function as a tone generator that is compatible with GM System Level 1.

11110000	F0H	= Exclusive status
01111110	7EH	= Universal Non-Real Time
01111111	7FH	= ID of target device
00001001	09H	= Sub-ID #1 = General MIDI Message
00000001	01H	= Sub-ID #2 = General MIDI On
11110111	F7H	= End of Exclusive
or,		
11110000	F0H	= Exclusive status
01111110	7EH	= Universal Non-Real Time
0xxxxnnn	XNH	= N:Device Number, X:don't care
00001001	09H	= Sub-ID #1 = General MIDI Message
00000001	01H	= Sub-ID #2 = General MIDI On
11110111	F7H	= End of Exclusive

When this message is received, the SOUND MODULE MODE is set to XG, and all MIDI messages defined by GM will be received.

All data except for MIDI Master Tuning will be restored to the default value.

However this message will not be received in any of the following cases.

- SOUND MODULE MODE = C/M
- MU100 System Parameter (see table 2-2) Rcv GM EXCLUSIVE MESSAGE= OFF

Since approximately 50[ms] is required in order to process this message, be sure to allow an appropriate interval before sending the next message.

2.1.2.2 Identity Request

11110000	F0H	= Exclusive status
01111110	7EH	= Universal Non-Real Time

0nnnnnnnn	MMH	= Device Number
00000110	06H	= Sub-ID #1 = General Information
00000001	01H	= Sub-ID #2 = Identity Request
11110111	F7H	= End of Exclusive

When this message is received, this device will transmit an Identity Reply message as described in the following section 2.1.2.3.

2.1.2.3 Identity Reply

11110000	F0H	= Exclusive status
01111110	7EH	= Universal Non-Real Time
0nnnnnnnn	MMH	= Device Number
00000110	06H	= Sub-ID #1 = General Information
00000010	02H	= Sub-ID #2 = Identity Reply
01000011	43H	= YAMAHA ID
00000000	00H	= Device Family Code LSB
		MU100R ID #1
01000001	41H	= Device Family Code MSB
		MU100R ID #2
00000000	00H	= Device Number Code LSB
		MU100R ID #3
00000011	03H	= Device Number Code MSB
		MU100R ID #4
00000000	00H	
00000000	00H	
00000000	00H	
00000001	01H	= Tone Generator Code = XG
11110111	F7H	= End of Exclusive

This device will transmit this message when it receives the Identity Request message of 2.1.2.2.

2.1.3 XG parameter change

This message sets XG-related parameters. Each message can set a single parameter.

The message format is as follows.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:device Number
01001100	4CH	Model ID
0ggggggg	GGH	Address High
0nnnnnnnn	MMH	Address Mid
01111111	LLH	Address Low
0sssssss	SSH	Data
:	:	
11110111	F7H	End of Exclusive

For parameters whose Data Size is 2 or 4, the appropriate amount of data will be transmitted as indicated by Size.

2.1.3.1 XG System On

This system exclusive message causes the MU100R to function as an "XG"-compatible tone generator.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:device Number
01001100	4CH	Model ID
00000000	00H	Address High
00000000	00H	Address Mid
01111110	7EH	Address Low
00000000	00H	Data
11110111	F7H	End of Exclusive

When On is received, the SOUND MODULE MODE will be set to XG, and all MIDI messages defined by XG such as NRPN or bank select etc. can be received.  
Since approximately 50[ms] are required in order to execute this message, please allow an appropriate interval before transmitting the next message.

2.1.3.2 XG System parameter change

This message sets the XG SYSTEM block (refer to tables <1 - 1>, <1 - 2>).

2.1.3.3 Multi Effect1 parameter change

This message sets the MULTI EFFECT1 block (refer to tables <1 - 1>, <1 - 4>).

2.1.3.4 Multi EQ parameter change

This message sets the MULTI EQ block (refer to tables <1 - 1>, <1 - 5>).

2.1.3.5 Multi Effect2 parameter change

This message sets the MULTI EFFECT2 block (refer to tables <1 - 1>, <1 - 6>).

2.1.3.6 Unique Effect parameter change

This messages set the Unique Effect block (refer to tables <1 - 1>, <1 - 7>).

2.1.3.7 Display parameter change

This message sets the DISPLAY block (refer to tables <1 - 1>, <1 - 8>).

2.1.3.8 Multi Part parameter change

This message sets the MULTI PART block (refer to tables <1 - 1>, <1 - 9>).

2.1.3.9 AD Part parameter change

This message sets the AD PART block (refer to tables <1 - 1>, <1 - 10>).

2.1.3.10 AD System parameter change

This message sets the AD SYSTEM block (refer to tables <1 - 1>, <1 - 11>).

2.1.3.11 Drums Setup parameter change

This message sets the DRUMS SETUP block (refer to tables <1 - 1>, <1 - 12>).

2.1.3.12 Part Assign parameter change

This messages set the Part Assign block (refer to tables <1 - 1>, <1 - 13>).

2.1.4 MU100 native parameter change (1)

This message sets parameters unique to the MU100. Each message sets a single parameter.  
As indicated below, the message format is in common with the MU50, MU80, and MU90.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:Device Number
01001001	49H	Model ID
0ggggggg	GGH	Address High
0mmmmmmmm	MMH	Address Mid
01111111	LLH	Address Low
0vvvvvvv	VVH	Data
:	:	
11110111	F7H	End of Exclusive

For parameters whose Data Size is 2 or 4, the number of data bytes indicated by Size are transmitted.

2.1.4.1 MU100 System parameter change

This message sets the SYSTEM block (refer to tables <2 - 1>, <2 - 2>).

2.1.4.2 Remote Switch

This message sets the REMOTE SWITCH (refer to tables <2 - 1>, <2 - 3>).

2.1.5 MU100 native parameter change (2)

This message sets parameters which are unique to the MU100. Each message modifies a single parameter.  
The format of this message is the same as for the MU90, as shown below.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:Device Number
01011001	59H	Model ID
0ggggggg	GGH	Address High
0mmmmmmmm	MMH	Address Mid
01111111	LLH	Address Low
0vvvvvvv	VVH	Data
:	:	
11110111	F7H	End of Exclusive

For parameters whose Data Size is 2 or 4, the number of data bytes indicated by Size are transmitted.

2.1.5.1 Current Performance parameter change

This message sets the CURRENT PERFORMANCE block (refer to tables <3 - 1>, <3 - 2>).

2.1.6 VL70-m native parameter changes

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:Device Number
01010111	57H	Model ID
0ggggggg	GGH	Address High
0mmmmmm	MMH	Address Mid
01111111	LLH	Address Low
0vvvvvvv	VVH	Data
:	:	:
11110111	F7H	End of Exclusive

2.1.6.1 VL System parameter change (refer to table <4 - 1>).

2.1.6.2 VL Current Voice/Common Misc parameter change (refer to table <4 - 2>).

2.1.6.3 VL Part parameter change (refer to table <4 - 3>).

2.1.6.4 VL Current Voice/Element parameter change (refer to table <4 - 4>).

2.1.7 Other parameter changes

2.1.7.1 Master tuning

This message simultaneously modifies the tuning of all channels.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:device Number
00100111	27H	Model ID
00110000	30H	Address High
00000000	00H	Address Mid
00000000	00H	Address Low
0000mmmm	0MH	Master Tune MSB
00001111	0LH	Master Tune LSB
0xxxxxxx	XXH	don't care
11110111	F7H	End of Exclusive

Normally, the XG SYSTEM message MASTER TUNE should be used (refer to table <1-2>).

2.2 Bulk dump

This device uses the following bulk dump messages.

[XG BULK DUMP]

- 1) XG System bulk dump
- 2) System Information bulk dump
- 3) Multi Effect1 bulk dump
- 4) Multi EQ bulk dump
- 5) Multi Effect2 bulk dump
- 6) Multi Part bulk dump
- 7) AD Part bulk dump
- 8) Drums Setup bulk dump

[MU100 NATIVE BULK DUMP 1]

- 1) MU100 System bulk dump
- 2) MU80, MU50 Internal Performance bulk dump

[MU100 NATIVE BULK DUMP 2]

- 1) MU100 Internal Performance bulk dump

[VL70-m NATIVE BULK DUMP]

- 1) VL System bulk dump
- 2) VL Current Voice/Common Misc bulk dump
- 3) VL Part bulk dump
- 4) VL Current Voice/Element bulk dump
- 5) VL Custom Voice bulk dump
- 6) VL Internal Voice bulk dump

2.2.1 XG bulk dump

This message sets XG-related parameters. Unlike parameter change messages, a single message can modify multiple parameters. The message format is as follows.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0000nnnn	0NH	N:Device Number
01001100	4CH	Model ID
0sssssss	SSH	ByteCountMSB
0tttttttt	TTH	ByteCountLSB
0ggggggg	GGH	Address High
0mmmmmm	MMH	Address Mid
01111111	LLH	Address Low
0vvvvvvv	VVH	Data
:	:	:
0kkkkkkk	KKH	Check-sum
11110111	F7H	End of Exclusive

Address and Byte Count are given in tables 1-n. Byte Count is indicated by the total size of the Data in tables 1-n. Bulk dump and dump request messages are received when the beginning of the block is specified as the 'Address'. 'Block' indicates the unit of the data string that is indicated in tables 1-n as 'Total size'. Check sum is the value that produces a lower 7 bits of 0 when the Start Address, Byte Count, Data, and the Check-sum itself are added.

2.2.1.1 XG System bulk dump

This message sets the XG SYSTEM block (refer to tables <1 -1>, <1 - 2>).

2.2.1.2 System Information bulk dump

This message indicates the contents of the SYSTEM INFORMATION block (refer to tables <1 - 1>, <1 - 3>).

This message is transmitted in response to a Dump Request, but this message will be ignored if it is received.

2.2.1.3 Multi Effect1 bulk dump

This message sets the MULTI EFFECT1 block (refer to tables <1 - 1>, <1 - 4>).

2.2.1.4 Multi EQ bulk dump

This message sets the MULTI EQ block (refer to tables <1 - 1>, <1 - 5>).

2.2.1.5 Multi Effect2 bulk dump

This message sets the MULTI EFFECT2 block (refer to tables <1 - 1>, <1 - 6>).

2.2.1.6 Unique Effect bulk dump

This messages set the Unique Effect block (refer to tables <1 - 1>, <1 - 7>).

2.2.1.7 Multi Part bulk dump

This message sets the MULTI PART block (refer to tables <1 - 1>, <1 - 9>).

2.2.1.8 A/D Part bulk dump

This message sets the A/D PART block (refer to tables <1 - 1>, <1 - 10>).

2.2.1.9 Drums Setup bulk dump

This message sets the DRUMS SETUP block (refer to tables <1 - 1>, <1 - 12>).

2.2.2 MU100 native bulk dump (1)

This message modifies parameters unique to the MU100. Unlike parameter change messages, a single message will modify multiple parameters.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0000nnnn	0NH	N:Device Number
01001001	49H	Model ID
0sssssss	SSH	ByteCountMSB
0tttttttt	TTH	ByteCountLSB
0gggggggg	GGH	Address High
0mmmmmmmm	MMH	Address Mid
01111111	LLH	Address Low
0vvvvvvvv	VVH	Data
:	:	:
0kkkkkkkk	KKH	Check-sum
11110111	F7H	End of Exclusive

Details are the same as for 2.2.1 XG Bulk Dump. However, refer to table 2-n for the address, byte count, and block.

2.2.2.1 MU100 System bulk dump

This message sets the SYSTEM block (refer to tables <2 - 1>, <2 - 2>).

2.2.2.2 MU80, MU50 Internal Performance bulk dump

This message is in MU80 / MU50 data format. It sets the INTERNAL PERFORMANCE block (refer to tables <2 - 1>, <2 - 4>).

2.2.3 MU100 native bulk dump (2)

This message sets parameters unique to the MU100. Unlike parameter change messages, a single message can modify multiple parameters.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0000nnnn	0NH	N:Device Number
01011001	59H	Model ID
0sssssss	SSH	ByteCountMSB
0tttttttt	TTH	ByteCountLSB
0gggggggg	GGH	Address High
0mmmmmmmm	MMH	Address Mid
01111111	LLH	Address Low
0vvvvvvvv	VVH	Data
:	:	:
0kkkkkkkk	KKH	Check-sum
11110111	F7H	End of Exclusive

Details are the same as for 2.2.1 XG Bulk Dump. However, refer to table 3-n for address, byte count, and block.

2.2.3.1 MU100 Internal Performance bulk dump

This message sets the INTERNAL PERFORMANCE block (refer to tables <3 - 1>, <3 - 3>).

2.2.4 VL70-m native bulk dump

This messages set parameters that are unique to the VL section.

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0001nnnn	1NH	N:Device Number
01010111	57H	Model ID
0sssssss	SSH	ByteCountMSB
0tttttttt	TTH	ByteCountLSB
0gggggggg	GGH	Address High
0mmmmmmmm	MMH	Address Mid
01111111	LLH	Address Low
0vvvvvvvv	VVH	Data
:	:	:
0kkkkkkkk	KKH	Check-sum
11110111	F7H	End of Exclusive

- 2.2.4.1 VL System parameter change  
(refer to table <4 - 1>).
- 2.2.4.2 VL Current Voice/Common  
Misc parameter change (refer to  
table <4 - 2>).
- 2.2.4.3 VL Part parameter change (refer  
to table <4 - 3>).
- 2.2.4.4 VL Current Voice/Element  
parameter change (refer to table  
<4 - 4>).
- 2.2.4.5 VL Custom Voice bulk dump  
(refer to table <4 - 5>).
- 2.2.4.6 VL Internal Voice bulk dump  
(refer to table <4 - 6>).

2.3 Parameter request

This message requests transmission of a parameter value.  
The output is transmitted in the Parameter Change message format  
(refer to 2.1.3, 2.1.4, and 2.1.5).

2.3.1 XG parameter request

This message requests transmission of XG parameter  
settings.  
Settings are transmitted in the format of an XG parameter  
change (refer to 2.1.3).

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0011nnnn	3NH	N:device Number
01001100	4CH	Model ID
0ggggggg	GGH	Address High
0mmmmmm	MMH	Address Mid
01111111	LLH	Address Low
11110111	F7H	End of Exclusive

2.3.2 MU100 native parameter request (1)

This message requests transmission of a parameter value  
unique to the MU100.  
The output is transmitted in the format of a MU100 native  
parameter change (refer to 2.1.4).

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0011nnnn	3NH	N:Device Number
01001001	49H	Model ID
0ggggggg	GGH	Address High
0mmmmmm	MMH	Address Mid
01111111	LLH	Address Low
11110111	F7H	End of Exclusive

2.3.3 MU100 native parameter request (2)

This message requests the transmission of a parameter value  
unique to the MU100.  
The output format is the same as for a MU100 native  
parameter change (refer to 2.1.5).

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0011nnnn	3NH	N:Device Number
01011001	59H	Model ID
0ggggggg	GGH	Address High
0mmmmmm	MMH	Address Mid
01111111	LLH	Address Low
11110111	F7H	End of Exclusive

2.4 Dump request

This message requests transmission of a specific block of parameter  
values.  
The output is the same as the bulk dump format.

2.4.1 XG dump request

This message requests transmission of all parameters of the  
specified block of XG parameters.  
The output is the same as the format of XG bulk dump (refer  
to 2.2.1).

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0010nnnn	2NH	N:device Number
01001100	4CH	Model ID
0ggggggg	GGH	Address High
0mmmmmm	MMH	Address Mid
01111111	LLH	Address Low
11110111	F7H	End of Exclusive

Address is valid only when the beginning of the block has  
been specified.  
Reception/transmission of Dump Request cannot be turned  
off by MIDI switches other than Exclusive = off.

2.4.2 MU100 native dump request (1)

This message requests transmission of all parameters of the  
specified block of MU100 native parameters.  
The output is in the same format as an MU100 native bulk  
dump (refer to 2.2.2).

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0010nnnn	2NH	N:Device Number
01001001	49H	Model ID
0ggggggg	GGH	Address High
0mmmmmm	MMH	Address Mid
01111111	LLH	Address Low
11110111	F7H	End of Exclusive

Details are the same as for 2.4.1 XG Bulk Dump Request.



2.4.3 MU100 native dump request (2)

This message requests transmission of all parameter values of the specified MU100 native parameter block. The output is in the format of MU100 Native Bulk Dump (refer to 2.2.3).

11110000	F0H	Exclusive status
01000011	43H	YAMAHA ID
0010nnnn	2NH	N:Device Number
01011001	59H	Model ID
0ggggggg	GGH	Address High
0mmmmmm	MMH	Address Mid
01111111	LLH	Address Low
11110111	F7H	End of Exclusive

Details are the same as for 2.4.1 XG Bulk Dump Request.

3. Realtime messages

3.1 Active sensing

This message is used to prevent problems which could occur if a MIDI cable were to be disconnected or broken during a performance. When this message is received, the MU100R will begin monitoring the state of the MIDI cable.

- a) Transmission not transmitted.
- b) Receive ReceptionOnce FE has been received, failure to receive any MIDI message for an interval longer than approximately 300 msec will cause processing to be performed as if ALL SOUND OFF, ALL NOTE OFF, and RESET ALL CONTROLLERS messages were received, and the unit will reset to a condition in which FE was never received.

4.1 Channel messages (for Harmony Effect)

4.1.1 Note on/note off

			Harmony ch	Melody ch
9n	kk	vv	note on message	
			For Vocoder harmony, used to specify the pitch to be sounded.	
			For Chordal harmony, used to detect chords.	
8n	kk	vv	note off message	
9n	kk	00		
n	:		MIDI channel	
kk	:		note number	
vv	:		velocity	

Velocity values are ignored.  
For the Harmony channel, processing will be as follows.  
1) For Vocoder harmony, these messages will specify the pitch to be sounded.  
2) For Chordal harmony, these messages are used to detect chords.  
For the Melody channel, these messages are received for the following purposes.  
1) For Vocoder harmony, these messages are received as the basic pitch to control the gender of the harmony sound.  
2) For Vocoder harmony, if Vocoder Mode is "Auto Transpose," the basic pitch is received.  
For both 1) and 2), if the Melody channel is off, the input audio will be the basic pitch.  
3) When Lead Gender and Lead Pitch Correction are on the input pitch is shifted to the note-on pitch of the received note.  
If the Melody channel is off, the pitch will be shifted to the nearest chromatic pitch.

4.1.2 Control changes

Bn	cc	VV
n	:	MIDI channel
cc	:	control#
vv	:	data

4.1.2.1 Data Entry

This message sets the value of the parameter that was specified by RPN (refer to 1.2.4) or NRPN (refer to 1.2.3).

Control#	Parameter	Data Range	Harmony ch	Melody ch
6	Data Entry MSB	0...127		

4.1.2.2 Hold1

This message controls sustain pedal on/off.

Control#	Parameter	Data Range	Harmony ch	Melody ch
64	Hold1	0...63, 64...127 (OFF, ON)	<input type="radio"/>	X

When ON, currently-sounding notes will be sustained even after note-off is received.

4.1.2.3 NRPN (Non-registered parameter number)

This message is used to set sound parameters such as vibrato or detune, etc.  
The NRPN MSB and NRPN LSB specify the parameter which is to be controlled, and subsequently Data Entry (refer to 1.2.1) is used to set the value of the specified parameter. Only the MSB of Data Entry is recognized.

Control#	Parameter	Data Range	Harmony ch	Melody ch
98	NRPN LSB	0...127	<input type="radio"/>	<input type="radio"/>
99	NRPN MSB	0...127		

The following NRPN messages are recognized.

NRPN MSB LSB	Data Entry MSB	Parameter name and range of values	Harmony ch	Melody ch
00 00	mm	Harmony Mute mm : 00 - 63 (off), 64 - 127 (on)	<input type="radio"/>	X
01 08	mm	Vibrato Rate Modulation mm : 00 - 64 - 127 (0...127)  Melody channel is effective only when Gender is ON.	<input type="radio"/>	<input type="radio"/>
01 09	mm	Vibrato Depth Modulation mm : 00 - 64 - 127 (0...127)  Melody channel is effective only when Gender is ON.	<input type="radio"/>	<input type="radio"/>
01 10	mm	Vibrato Delay Modulation mm : 00 - 64 - 127 (0...127)  Melody channel is effective only when Gender is ON.	<input type="radio"/>	<input type="radio"/>
01 26	mm	Detune Modulation mm : 00 - 127 (0...127)  Controls the overall amount of detune specified for the individual voice.  The following NRPN numbers independently control the volume of each harmony note. The currently-sounding harmony notes are numbered sequentially beginning from the lowest note.	<input type="radio"/>	X
02 16	mm	Harmony 1 Volume mm : 00 - 127 (0...127)	<input type="radio"/>	X
02 17	mm	Harmony 2 Volume mm : 00 - 127 (0...127)	<input type="radio"/>	X
02 18	mm	Harmony 3 Volume mm : 00 - 127 (0...127)  The following NRPN numbers independently control the panning of each harmony note.	<input type="radio"/>	X

02	32	mm	The currently-sounding harmony notes are numbered sequentially beginning from the lowest note. When the value is 0, panning will be random. For random panning with Vocoder harmony, the pan position will change at each key-on. For random panning with Chordal harmony, the pan position will change whenever the chord changes. For Detune and Chromatic harmony, random pan will not function, and the panning will be centered.		
			Harmony 1 Pan	<input type="radio"/>	X
			mm : 00, 01 - 64 - 127 (random, Lch...center...Rch)		
	33	mm	Harmony 2 Pan	<input type="radio"/>	X
			mm : 00, 01 - 64 - 127 (random, Lch...center...Rch)		
	34	mm	Harmony 3 Pan	<input type="radio"/>	X
The following NRPN numbers independently control the detune amount for each harmony sound. The currently-sounding harmony notes are numbered sequentially beginning from the lowest note.					
02	48	mm	Harmony 1 Detune	<input type="radio"/>	X
			mm : 00 - 64 - 127 (-64...0...+63)		
	49	mm	Harmony 2 Detune	<input type="radio"/>	X
			mm : 00 - 64 - 127 (-64...0...+63)		
	50	mm	Harmony 3 Detune	<input type="radio"/>	X
			mm : 00 - 64 - 127 (-64...0...+63)		

4.1.2.4 RPN (Registered Parameter Number)

This message is used to set Pitch Bend Sensitivity.  
RPN MSB and RPN LSB are used to specify the parameter which is to be controlled, and subsequently Data Entry (refer to 1.2.1) is used to set the value of the specified parameter.  
Only the MSB of Data Entry is recognized.

Control#	Parameter	Data Range
100	RPN LSB	0...127
101	RPN MSB	0...127

The following RPN numbers are recognized.

RPN MSB LSB	Data Entry MSB	Parameter name and range of values	Harmony ch	Melody ch
00 00	mm	Pitch Bend Sensitivity mm : 00 - 24 (0...24 semitones) Settable in semitone steps over a two-octave range	<input type="radio"/>	<input type="radio"/>
127 127	--	RPN null Set RPN and NRPN numbers to a condition in which no numbers have been specified. Internal settings will not be affected.	<input type="radio"/>	<input type="radio"/>

4.1.2.5 All Note Off

For Vocoder harmony, this message turns off all currently-sounding harmony notes.

Control#	Parameter	Data Range
123	All Note Off	0

4.1.3 Pitch Bend



This message conveys operations of the pitch bender.  
It will modify the pitch in the range specified by RPN Pitch Ben Sensitivity.  
For the Melody channel, this message will have an effect only when Lead Gender is ON.

4.2 System exclusive messages (for Harmony Effect)

4.2.1 Chord Control Code

F0 43 7E 02 cr ct 7F 7F F7

For Chordal mode, this is used to specify the chord.  
The chord can also be specified by Note-on messages.

cr : chord root (off f n n n n)

fff : Accidental	nnnn : Note
0 : bbb	0 : reserved
1 : bb	1 : C
2 : b	2 : D
3 : natural	3 : E
4 : #	4 : F
5 : ##	5 : G
6 : ###	6 : B

ct : chord type

0 : Maj
1 : Maj6
2 : Maj7
3 : Maj7 (#11)
4 : Maj (9)
5 : Maj7 (9)
6 : Maj6 (9)
7 : aug
8 : min
9 : min6
0A : min7
0B : min7b5
0C : min (9)
0D : min7 (9)
0E : min7 (11)
0F : minMaj7
10 : minMaj7 (9)
11 : dim
12 : dim7
13 : 7th
14 : 7sus4
15 : 7b5
16 : 7 (9)
17 : 7(#11)
18 : 7 (13)
19 : 7 (b9)
1A : 7 (b13)
1B : 7 (#9)
1C : Maj7aug
1D : 7aug
1E : 1+8

1F : 1+5  
20 : sus4  
21 : 1+2+5  
22 : chord cancel     Same processing as chord-off.

(Example) To specify Am7,  
F0 43 7E 02 36 0A 7F 7F F7  
(A) (m7)

< Table 1 - 1 >

Parameter Base Address  
Model ID = 4C

Parameter	Adress			Description
	(H)	(M)	(L)	
XG SYSTEM	00	00	00	System
	00	00	7D	Drum setup Reset
	00	00	7E	XG System On
	00	00	7F	All Parameter Reset
INFORMATION	01	00	00	System Information
EFFECT 1	02	01	00	Effect 1 (Reverb, Chorus, Variation)
	02	40	00	Multi EQ
EFFECT 2	03	00	00	Insertion Effect 1
	03	01	00	Insertion Effect 2
UNIQUE EFFECT	04	00	00	Insertion Effect (VH)
DISPLAY	06	00	00	Display Letter
	07	00	00	Display Bit Map
MULTI PART	08	00	00	Multi Part 1
				:
	08	0F	00	Multi Part 16
	08	10	00	Multi Part 17
MULTI PART (additional)				:
	0A	00	00	Multi Part 1
	0A	0F	00	Multi Part 16
	0A	10	00	Multi Part 17
A/D PART				:
	10	00	00	A/D Part 1
	10	01	00	A/D Part 2
A/D SYSTEM	11	00	00	A/D System
DRUM	30	0D	00	Drum Setup 1
	31	0D	00	Drum Setup 2
	32	0D	00	Drum Setup 3
	33	0D	00	Drum Setup 4
PART ASSIGN	70	00	00	VL Part Assign

Address	Parameter
3n 0D 00	note number 13
3n 0E 00	note number 14
:	:
3n 5B 00	note number 91

< Table 1 - 2 >

MIDI Parameter Change table (XG SYSTEM)							
Address		Size	Data	Parameter	Description	Default value	
(H)		(H)	(H)			(H)	
00	00	00	4	00 - 0F	MASTER TUNE	-102.4...0...+102.3 [cent]	00 04 00 00
		01		00 - 0F		1st bit3-0→bit15-12	
		02		00 - 0F		2nd bit3-0→bit11-8	
		03		00 - 0F		3rd bit3-0→bit7-4	
						4th bit3-0→bit3-0	
		04	1	00 - 7F	MASTER VOLUME	0...127	7F
		05	1	00 - 7F	MASTER ATTENUATOR	0...127	00
		06	1	28 - 58	TRANPOSE	-24...0...+24 [semitones]	40
		7D	1	N	DRUM SETUP RESET	N: Drum setup number (receive only)	--
		7E	1	00	XG SYSTEM ON	00 = XG system ON (receive only)	--
		7F	1	00	ALL PARAMETER RESET	00 = ON (receive only)	--
TOTAL SIZE		07					

< Table 1 - 3 >

MIDI Parameter Change table (SYSTEM INFORMATION)						
Address (H)		Size (H)	Data (H)	Parameter		
01	00	00	E	20 - 7F	Model Name 1	32...127(ASCII CHARACTER)
		:	:	:	:	:
		0D		20 - 7F	Model Name 14	32...127 (ASCII CHARACTER)
		0E	1	00 - 7F	XG Level 1	
		0F	1	00 - 7F	XG Level 2	
TOTAL SIZE		10				

Transmitted in response to Dump Request. Not received.

< Table 1 - 4 >

MIDI Parameter Change table (EFFECT 1)							
Address			Size	Data	Parameter	Description	Default value
(H)			(H)	(H)			(H)
02	01	00	2	00 - 7F	REVERB TYPE MSB	refer to Effect Program List	01 (= HALL1)
				00 - 7F	REVERB TYPE LSB	-	00
		02	1	00 - 7F	REVERB PARAMETER 1	-	12 (depends on reverb type)
		03	1	00 - 7F	REVERB PARAMETER 2	-	0A (-)
		04	1	00 - 7F	REVERB PARAMETER 3	-	08 (-)
		05	1	00 - 7F	REVERB PARAMETER 4	-	0D (-)
		06	1	00 - 7F	REVERB PARAMETER 5	-	31 (-)
		07	1	00 - 7F	REVERB PARAMETER 6	-	00 (-)
		08	1	00 - 7F	REVERB PARAMETER 7	-	00 (-)
		09	1	00 - 7F	REVERB PARAMETER 8	-	00 (-)
		0A	1	00 - 7F	REVERB PARAMETER 9	-	00 (-)
		0B	1	00 - 7F	REVERB PARAMETER 10	-	00 (-)
		0C	1	00 - 7F	REVERB RETURN	-∞dB...0dB...+6dB (0...96...127)	40
		0D	1	01 - 7F	REVERB PAN	L63...C...R63	40
TOTAL SIZE			0E				
02	01	10	1	00 - 7F	REVERB PARAMETER 11	refer to Effect Parameter List	00 (depends on reverb type)
		11	1	00 - 7F	REVERB PARAMETER 12	-	04 (-)
		12	1	00 - 7F	REVERB PARAMETER 13	-	32 (-)
		13	1	00 - 7F	REVERB PARAMETER 14	-	08 (-)
		14	1	00 - 7F	REVERB PARAMETER 15	-	40 (-)
		15	1	00 - 7F	REVERB PARAMETER 16	-	00 (-)
TOTAL SIZE			6				
02	01	20	2	00 - 7F	CHORUS TYPE MSB	refer to Effect Program List	41 (= CHORUS1)
				00 - 7F	CHORUS TYPE LSB	-	00

			22	1	00 - 7F	CHORUS PARAMETER 1	~	06 (depends on chorus type)
			23	1	00 - 7F	CHORUS PARAMETER 2	~	36 (-)
			24	1	00 - 7F	CHORUS PARAMETER 3	~	4D (-)
			25	1	00 - 7F	CHORUS PARAMETER 4	~	6A (-)
			26	1	00 - 7F	CHORUS PARAMETER 5	~	00 (-)
			27	1	00 - 7F	CHORUS PARAMETER 6	~	1C (-)
			28	1	00 - 7F	CHORUS PARAMETER 7	~	40 (-)
			29	1	00 - 7F	CHORUS PARAMETER 8	~	2E (-)
			2A	1	00 - 7F	CHORUS PARAMETER 9	~	40 (-)
			2B	1	00 - 7F	CHORUS PARAMETER 10	~	40 (-)
			2C	1	00 - 7F	CHORUS RETURN	-∞dB...0dB...+6dB (0...96...127)	40
			2D	1	01 - 7F	CHORUS PAN	L63...C...R63 (1...64...127)	40
			2E	1	00 - 7F	SEND CHORUS TO REVERB	-∞dB...0dB...+6dB (0...96...127)	00
TOTAL SIZE			0F					
02	01	30	1	00 - 7F	CHORUS PARAMETER 11	refer to Effect Parameter List	2E (depends on chorus type)	
		31	1	00 - 7F	CHORUS PARAMETER 12	~	40 (-)	
		32	1	00 - 7F	CHORUS PARAMETER 13	~	0A (-)	
		33	1	00 - 7F	CHORUS PARAMETER 14	~	00 (-)	
		34	1	00 - 7F	CHORUS PARAMETER 15	~	00 (-)	
		35	1	00 - 7F	CHORUS PARAMETER 16	~	00 (-)	
TOTAL SIZE			6					
02	01	40	2	00 - 7F	VARIATION TYPE MSB	refer to Effect Program List	05 (= DELAY L, C, R)	
				00 - 7F	VARIATION TYPE LSB	~	00	
		42	2	00 - 7F	VARIATION PARAMETER 1 MSB	~	1A (depends on variation type)	
				00 - 7F	VARIATION PARAMETER 1 LSB	~	05 (-)	
		44	2	00 - 7F	VARIATION PARAMETER 2 MSB	~	0D (-)	
				00 - 7F	VARIATION PARAMETER 2 LSB	~	03 (-)	
		46	2	00 - 7F	VARIATION PARAMETER 3 MSB	~	27 (-)	
				00 - 7F	VARIATION PARAMETER 3 LSB	~	08 (-)	
		48	2	00 - 7F	VARIATION PARAMETER 4 MSB	~	27 (-)	
				00 - 7F	VARIATION PARAMETER 4 LSB	~	08 (-)	
		4A	2	00 - 7F	VARIATION PARAMETER 5 MSB	~	00 (-)	
				00 - 7F	VARIATION PARAMETER 5 LSB	~	4A (-)	
		4C	2	00 - 7F	VARIATION PARAMETER 6 MSB	~	00 (-)	
				00 - 7F	VARIATION PARAMETER 6 LSB	~	64 (-)	
		4E	2	00 - 7F	VARIATION PARAMETER 7 MSB	~	00 (-)	
				00 - 7F	VARIATION PARAMETER 7 LSB	~	0A (-)	
		50	2	00 - 7F	VARIATION PARAMETER 8 MSB	~	00 (-)	
				00 - 7F	VARIATION PARAMETER 8 LSB	~	00 (-)	
		52	2	00 - 7F	VARIATION PARAMETER 9 MSB	~	00 (-)	
				00 - 7F	VARIATION PARAMETER 9 LSB	~	00 (-)	
		54	2	00 - 7F	VARIATION PARAMETER 10 MSB	~	00 (-)	
				00 - 7F	VARIATION PARAMETER 10 LSB	~	20 (-)	
		56	1	00 - 7F	VARIATION RETURN	-∞dB...0dB...+6dB (0...96...127)	40	
		57	1	01 - 7F	VARIATION PAN	L63...C...R63 (1...64...127)	40	
		58	1	00 - 7F	SEND VARIATION TO REVERB	-∞dB...0dB...+6dB (0...96...127)	00	
		59	1	00 - 7F	SEND VARIATION TO CHORUS	-∞dB...0dB...+6dB (0...96...127)	00	
		5A	1	00 - 01	VARIATION CONNECTION	INSERTION, SYSTEM	00	
		5B	1	00 - 7F	VARIATION PART NUMBER	Part1...32 (0...31)	7F	
						AD1, AD2 (64, 65)		
						OFF (127)		
		5C	1	00 - 7F	MW VARIATION CONTROL DEPTH	-64...0...+63	40	
		5D	1	00 - 7F	BEND VARIATION CONTROL DEPTH	-64...0...+63	40	
		5E	1	00 - 7F	CAT VARIATION CONTROL DEPTH	-64...0...+63	40	
		5F	1	00 - 7F	AC1 VARIATION CONTROL DEPTH	-64...0...+63	40	
		60	1	00 - 7F	AC2 VARIATION CONTROL DEPTH	-64...0...+63	40	
TOTAL SIZE			21					
02	01	70	1	00 - 7F	VARIATION PARAMETER 11	refer to Effect Parameter List	00 (depends on variation type)	
		71	1	00 - 7F	VARIATION PARAMETER 12	~	3C (-)	
		72	1	00 - 7F	VARIATION PARAMETER 13	~	1C (-)	

73	1	00 - 7F	VARIATION PARAMETER 14	-	40 (-)
74	1	00 - 7F	VARIATION PARAMETER 15	-	2E (-)
75	1	00 - 7F	VARIATION PARAMETER 16	-	40 (-)
TOTAL SIZE		6			

< Table 1 - 5 >

MIDI Parameter Change table (MULTI EQ)					
Address (H)		Size (H)	Data (H)	Parameter	Description  Default value (H)
02	40	00	1	00 - 04	EQ TYPE flat, jazz, pops, rock, classic 00
		01	1	34 - 4C	EQ GAIN1 -12...0...+12 [dB] 40 (depends on EQ type)
		02	1	04 - 28	EQ FREQUENCY1 32...2.0k [Hz] 0C (-)
		03	1	01 - 78	EQ Q1 0.1...12.0 07 (-)
		04	1	00 - 01	EQ SHAPE1 shelving, peaking 00 (-)
		05	1	34 - 4C	EQ GAIN2 -12...0...+12 [dB] 40 (-)
		06	1	0E - 36	EQ FREQUENCY2 100...10.0k [Hz] 1C (-)
		07	1	01 - 78	EQ Q2 0.1...12.0 07 (-)
		08	1		NOT USED --
		09	1	34 - 4C	EQ GAIN3 -12...0...+12 [dB] 40 (-)
		0A	1	0E - 36	EQ FREQUENCY3 100...10.0k [Hz] 22 (-)
		0B	1	01 - 78	EQ Q3 0.1...12.0 07 (-)
		0C	1		NOT USED --
		0D	1	34 - 4C	EQ GAIN4 -12...0...+12 [dB] 40 (-)
		0E	1	0E - 36	EQ FREQUENCY4 100...10.0k [Hz] 2E (-)
		0F	1	01 - 78	EQ Q4 0.1...12.0 07 (-)
		10	1		NOT USED --
		11	1	34 - 4C	EQ GAIN5 -12...0...+12 [dB] 40 (-)
		12	1	1C - 3A	EQ FREQUENCY5 0.5k...16.0k [Hz] 34 (-)
		13	1	01 - 78	EQ Q5 0.1...12.0 07 (-)
		14	1	00 - 01	EQ SHAPE5 shelving, peaking 00 (-)
TOTAL SIZE		15			

< Table 1 - 6 >

MIDI Parameter Change table (EFFECT 2)					
Address (H)		Size (H)	Data (H)	Parameter	Description  Default value (H)
03	00	00	2	00 - 7F	INSERTION EFFECT1 TYPE MSB refer to Effect Program List 49 (= DISTORTION)
				00 - 7F	INSERTION EFFECT1 TYPE LSB 00
		02	1	00 - 7F	INSERTION EFFECT1 PARAMETER1 28 (depends on insertion effect1 type)
		03	1	00 - 7F	INSERTION EFFECT1 PARAMETER2 14 (-)
		04	1	00 - 7F	INSERTION EFFECT1 PARAMETER3 48 (-)
		05	1	00 - 7F	INSERTION EFFECT1 PARAMETER4 35 (-)
		06	1	00 - 7F	INSERTION EFFECT1 PARAMETER5 40 (-)
		07	1	00 - 7F	INSERTION EFFECT1 PARAMETER6 00 (-)
		08	1	00 - 7F	INSERTION EFFECT1 PARAMETER7 2B (-)
		09	1	00 - 7F	INSERTION EFFECT1 PARAMETER8 4A (-)
		0A	1	00 - 7F	INSERTION EFFECT1 PARAMETER9 0A (-)
		0B	1	00 - 7F	INSERTION EFFECT1 PARAMETER10 7F (-)
		0C	1	00 - 7F	INSERTION EFFECT1 PART NUMBER Part1...32 (0...31) 7F
					AD1, AD2 (64, 65) OFF (127)
		0D	1	00 - 7F	MW INSERTION CONTROL DEPTH -64...0...+63 40
		0E	1	00 - 7F	BEND INSERTION CONTROL DEPTH -64...0...+63 40
		0F	1	00 - 7F	CAT INSERTION CONTROL DEPTH -64...0...+63 40
		10	1	00 - 7F	AC1 INSERTION CONTROL DEPTH -64...0...+63 40
		11	1	00 - 7F	AC2 INSERTION CONTROL DEPTH -64...0...+63 40
TOTAL SIZE		12			
		20	1	00 - 7F	INSERTION EFFECT1 PARAMETER11 refer to Effect Parameter List 78 (depends on insertion effect1 type)
		21	1	00 - 7F	INSERTION EFFECT1 PARAMETER12 00 (-)
		22	1	00 - 7F	INSERTION EFFECT1 PARAMETER13 00 (-)
		23	1	00 - 7F	INSERTION EFFECT1 PARAMETER14 00 (-)



24	1	00 - 7F	INSERTION EFFECT1 PARAMETER15 ~	00 (-)
25	1	00 - 7F	INSERTION EFFECT1 PARAMETER16 ~	00 (-)
TOTAL SIZE		6		
30	2	00 - 7F	INSERTION EFFECT1 PARAMETER1 MSB refer to Effect Parameter List	00 (depends on insertion effect1 type)
		00 - 7F	INSERTION EFFECT1 PARAMETER1 LSB ~	28 (-)
32	2	00 - 7F	INSERTION EFFECT1 PARAMETER2 MSB ~	00 (-)
		00 - 7F	INSERTION EFFECT1 PARAMETER2 LSB ~	14 (-)
34	2	00 - 7F	INSERTION EFFECT1 PARAMETER3 MSB ~	00 (-)
		00 - 7F	INSERTION EFFECT1 PARAMETER3 LSB ~	48 (-)
36	2	00 - 7F	INSERTION EFFECT1 PARAMETER4 MSB ~	00 (-)
		00 - 7F	INSERTION EFFECT1 PARAMETER4 LSB ~	35 (-)
38	2	00 - 7F	INSERTION EFFECT1 PARAMETER5 MSB ~	00 (-)
		00 - 7F	INSERTION EFFECT1 PARAMETER5 LSB ~	40 (-)
3A	2	00 - 7F	INSERTION EFFECT1 PARAMETER6 MSB ~	00 (-)
		00 - 7F	INSERTION EFFECT1 PARAMETER6 LSB ~	00 (-)
3C	2	00 - 7F	INSERTION EFFECT1 PARAMETER7 MSB ~	00 (-)
		00 - 7F	INSERTION EFFECT1 PARAMETER7 LSB ~	2B (-)
3E	2	00 - 7F	INSERTION EFFECT1 PARAMETER8 MSB ~	00 (-)
		00 - 7F	INSERTION EFFECT1 PARAMETER8 LSB ~	4A (-)
40	2	00 - 7F	INSERTION EFFECT1 PARAMETER9 MSB ~	00 (-)
		00 - 7F	INSERTION EFFECT1 PARAMETER9 LSB ~	0A (-)
42	2	00 - 7F	INSERTION EFFECT1 PARAMETER10 MSB ~	00(-)
		00 - 7F	INSERTION EFFECT1 PARAMETER10 LSB ~	7F (-)
TOTAL SIZE		14		

When using an EFFECT TYPE which does not require the MSB, parameters of addresses 02~0B are received, and parameters of addresses 30~42 are not received.

When using an EFFECT TYPE which requires the MSB, parameters of addresses 30~42 are received, and parameters of addresses 02~0B are not received.

Bulk data which includes the EFFECT TYPE is always transmitted with the parameters of addresses 02~0B, but in the case of an EFFECT TYPE which requires the MSB, parameters of addresses 02~0B are not received even for bulk reception.

03	01	00	2	00 - 7F	INSERTION EFFECT2 TYPE MSB refer to Effect Program List	49 (= DISTORTION)
				00 - 7F	INSERTION EFFECT2 TYPE LSB ~	00
		02	1	00 - 7F	INSERTION EFFECT2 PARAMETER1 ~	28(depends on insertion effect2 type)
		03	1	00 - 7F	INSERTION EFFECT2 PARAMETER2 ~	14 (-)
		04	1	00 - 7F	INSERTION EFFECT2 PARAMETER3 ~	48 (-)
		05	1	00 - 7F	INSERTION EFFECT2 PARAMETER4 ~	35 (-)
		06	1	00 - 7F	INSERTION EFFECT2 PARAMETER5 ~	40 (-)
		07	1	00 - 7F	INSERTION EFFECT2 PARAMETER6 ~	00 (-)
		08	1	00 - 7F	INSERTION EFFECT2 PARAMETER7 ~	2B (-)
		09	1	00 - 7F	INSERTION EFFECT2 PARAMETER8 ~	4A (-)
		0A	1	00 - 7F	INSERTION EFFECT2 PARAMETER9 ~	0A (-)
		0B	1	00 - 7F	INSERTION EFFECT2 PARAMETER10 ~	7F (-)
		0C	1	00 - 7F	INSERTION EFFECT2 PART NUMBER Part1...32 (0...31) AD1, AD2 (64, 65) OFF (127)	7F
		0D	1	00 - 7F	MW INSERTION CONTROL DEPTH -64...0...+63	40
		0E	1	00 - 7F	BEND INSERTION CONTROL DEPTH -64...0...+63	40
		0F	1	00 - 7F	CAT INSERTION CONTROL DEPTH -64...0...+63	40
		10	1	00 - 7F	AC1 INSERTION CONTROL DEPTH -64...0...+63	40
		11	1	00 - 7F	AC2 INSERTION CONTROL DEPTH -64...0...+63	40
TOTAL SIZE		12				
20	1	00 - 7F		INSERTION EFFECT2 PARAMETER11 refer to Effect Parameter List		78 (depends on insertion effect2 type)
21	1	00 - 7F		INSERTION EFFECT2 PARAMETER12 ~		00 (-)
22	1	00 - 7F		INSERTION EFFECT2 PARAMETER13 ~		00 (-)
23	1	00 - 7F		INSERTION EFFECT2 PARAMETER14 ~		00 (-)
24	1	00 - 7F		INSERTION EFFECT2 PARAMETER15 ~		00 (-)
25	1	00 - 7F		INSERTION EFFECT2 PARAMETER16 ~		00 (-)
TOTAL SIZE		6				

30	2	00 - 7F	INSERTION EFFECT2 PARAMETER1 MSB	refer to Effect Parameter List	00 (depends on insertion effect2 type)
		00 - 7F	INSERTION EFFECT2 PARAMETER1 LSB	-	28 (-)
32	2	00 - 7F	INSERTION EFFECT2 PARAMETER2 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETER2 LSB	-	14 (-)
34	2	00 - 7F	INSERTION EFFECT2 PARAMETER3 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETER3 LSB	-	48 (-)
36	2	00 - 7F	INSERTION EFFECT2 PARAMETER4 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETER4 LSB	-	35 (-)
38	2	00 - 7F	INSERTION EFFECT2 PARAMETERS5 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETERS5 LSB	-	40 (-)
3A	2	00 - 7F	INSERTION EFFECT2 PARAMETER6 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETER6 LSB	-	00 (-)
3C	2	00 - 7F	INSERTION EFFECT2 PARAMETER7 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETER7 LSB	-	2B (-)
3E	2	00 - 7F	INSERTION EFFECT2 PARAMETER8 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETER8 LSB	-	4A (-)
40	2	00 - 7F	INSERTION EFFECT2 PARAMETER9 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETER9 LSB	-	0A (-)
42	1	00 - 7F	INSERTION EFFECT2 PARAMETER10 MSB	-	00 (-)
		00 - 7F	INSERTION EFFECT2 PARAMETER10 LSB	-	7F (-)
TOTAL SIZE		14			

When using an EFFECT TYPE which does not require the MSB, parameters of addresses 02~0B are received, and parameters of addresses 30~42 are not received.

When using an EFFECT TYPE which requires the MSB, parameters of addresses 30~42 are received, and parameters of addresses 02~0B are not received.

Transmission of bulk data which includes EFFECT TYPE data will always include the parameters of addresses 02~0B, but in the case of an EFFECT TYPE which does not require the MSB, parameters of addresses 02~0B will not be received even in bulk reception.

< Table 1 - 7 >

MIDI Parameter Change table (UNIQUE EFFECT)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
04 00 00	2	00 - 7F	UNIQUE INSERTION EFFECT TYPE MSB	Refer to XG EFFECT MAP	59 (=Vocoder harmony)
		00 - 7F	UNIQUE INSERTION EFFECT TYPE LSB	00 : basic type	00
	02	1	UNIQUE INSERTION EFFECT PARAMETER1	Refer to Effect parameter list	depends on type
	03	1	UNIQUE INSERTION EFFECT PARAMETER2	-	-
	04	1	UNIQUE INSERTION EFFECT PARAMETER3	-	-
	05	1	UNIQUE INSERTION EFFECT PARAMETER4	-	-
	06	1	UNIQUE INSERTION EFFECT PARAMETERS5	-	-
	07	1	UNIQUE INSERTION EFFECT PARAMETER6	-	-
	08	1	UNIQUE INSERTION EFFECT PARAMETER7	-	-
	09	1	UNIQUE INSERTION EFFECT PARAMETER8	-	-
	0A	1	UNIQUE INSERTION EFFECT PARAMETER9	-	-
	0B	1	UNIQUE INSERTION EFFECT PARAMETER10	-	-
	0C	1	UNIQUE INSERTION EFFECT PART	Part1...32 (0...31) AD1, AD2 (64, 65) OFF (127)	7F
	0D	1	NOT USED		--
	0E	1	NOT USED		--
	0F	1	NOT USED		--
	10	1	NOT USED		--
	11	1	NOT USED		--
TOTAL SIZE		12			
04 00 14	1	00 - 7F	UNIQUE INSERTION EFFECT EXTERNAL CONTROL CH1 (HARMONY CHANNEL)	1...16 (0...15), off (127)	7F
	15	1	UNIQUE INSERTION EFFECT EXTERNAL CONTROL CH2 (MELODY CHANNEL)	-	7F
TOTAL SIZE		2			

04	00	20	1	00 - 7F	UNIQUE INSERTION EFFECT PARAMETER11	Refer to Effect parameter list	depends on type
		21	1	00 - 7F	UNIQUE INSERTION EFFECT PARAMETER12	-	-
		22	1	00 - 7F	UNIQUE INSERTION EFFECT PARAMETER13	-	-
		23	1	00 - 7F	UNIQUE INSERTION EFFECT PARAMETER14	-	-
		24	1	00 - 7F	UNIQUE INSERTION EFFECT PARAMETER15	-	-
		25	1	00 - 7F	UNIQUE INSERTION EFFECT PARAMETER16	-	-
TOTAL SIZE		6					

< Table 1 - 8 >

MIDI Parameter Change table (DISPLAY DATA)							
Address		Size	Data	Parameter	Description	Default value	
(H)		(H)	(H)			(H)	
06	00	00	20	20 - 7F	DISPLAY LETTER Data1	32...127(ASCII CHARACTER)	--
		:			:	:	:
		1F			DISPLAY LETTER Data32	32...127(ASCII CHARACTER)	--
TOTAL SIZE		20					
07	00	00	30	00 - 7F	DISPLAY BITMAP Data1*	0...127	--
		:			:	:	:
		2F			DISPLAY BITMAP Data48	0...127	--
TOTAL SIZE		30					

\* The relation between DISPLAY BITMAP data and the display screen

Seven pixels horizontally are one byte of data.  
Set a bit to 1 to display the corresponding pixel, and set a bit to 0 to turn it off.  
This data is mapped to the screen as follows.

b7 b6 b5 b4 b3 b2 b1 b0								b7 b6 b5 b4 b3 b2 b1 b0								b7 b6 b5 b4 b3 b2 b1 b0 ('b' stands for 'bit')								
Data1	0	*	*	*	*	*	*	Data17	0	*	*	*	*	*	*	*	Data33	0	*	*	-	-	-	-
Data2								Data18									Data34							
Data3								Data19									Data35							
Data4								Data20									Data36							
Data5								Data21									Data37							
Data6								Data22									Data38							
Data7								Data23									Data39							
Data8								Data24									Data40							
Data9								Data25									Data41							
Data10								Data26									Data42							
Data11								Data27									Data43							
Data12								Data28									Data44							
Data13								Data29									Data45							
Data14								Data30									Data46							
Data15								Data31									Data47							
Data16								Data32									Data48							

For Data33~Data48, only bit 6 and bit 5 are used.

Specific individual pixels of the bitmap data can also be received. In this case, other pixels will retain their previous state.  
DISPLAY DATA parameter changes can be transmitted continuously from a specified location.

< Table 1 - 9 >

MIDI Parameter Change table (MULTI PART)							
Address		Size	Data	Parameter	Description	Default value	
(H)		(H)	(H)			(H)	
08	nn	00	1	00 - 40	ELEMENT RESERVE	0...64 (Not valid for VL)	part10, 26 = 0 other parts = 2
	nn	01	1	00 - 7F	BANK SELECT MSB	0...127	part10,26 = 7F other parts = 0
	nn	02	1	00 - 7F	BANK SELECT LSB	0...127	00
	nn	03	1	00 - 7F	PROGRAM NUMBER	1...128	00
	nn	04	1	00-1F, 7F	Rcv CHANNEL	A1...A16, B1...B16, OFF	Part No.

nn	05	1	00 - 01	MONO/POLY MODE	MONO , POLY	01
nn	06	1	00 - 02	SAME NOTE NUMBER	SINGLE, MULTI, INST(for DRUM)	01
				KEY ON ASSIGN	(Not valid for VL)	
nn	07	1	00 - 05	PART MODE	NORMAL, DRUM, DRUMS1...4	Part10 = 2, Part26 = 4 other parts = 0
nn	08	1	28 - 58	NOTE SHIFT	-24...0...+24 [semitones]	40
nn	09	2	00 - 0F	DETUNE	-12.8...0...+12.7 [Hz]	08 00
nn	0A		00 - 0F		1st bit3-0→bit7-4 2nd bit3-0→bit3-0	
nn	0B	1	00 - 7F	VOLUME	0...127	64
nn	0C	1	00 - 7F	VELOCITY SENSE DEPTH	0...127	40
nn	0D	1	00 - 7F	VELOCITY SENSE OFFSET	0...127	40
nn	0E	1	00 - 7F	PAN	RND, L63...C...R63	40
nn	0F	1	00 - 7F	NOTE LIMIT LOW	C-2...G8	00
nn	10	1	00 - 7F	NOTE LIMIT HIGH	C-2...G8	7F
nn	11	1	00 - 7F	DRY LEVEL	0...127	7F
nn	12	1	00 - 7F	CHORUS SEND	0...127	00
nn	13	1	00 - 7F	REVERB SEND	0...127	28
nn	14	1	00 - 7F	VARIATION SEND	0...127	00
nn	15	1	00 - 7F	VIBRATO RATE	-64...0...+63	40
nn	16	1	00 - 7F	VIBRATO DEPTH	-64...0...+63	40
nn	17	1	00 - 7F	VIBRATO DELAY	-64...0...+63	40
nn	18	1	00 - 7F	LOW PASS FILTER CUTOFF FREQUENCY	-64...0...+63	40
nn	19	1	00 - 7F	LOW PASS FILTER RESONANCE	-64...0...+63	40
nn	1A	1	00 - 7F	EG ATTACK TIME	-64...0...+63	40
nn	1B	1	00 - 7F	EG DECAY TIME	-64...0...+63	40
nn	1C	1	00 - 7F	EG RELEASE TIME	-64...0...+63	40
nn	1D	1	28 - 58	MW PITCH CONTROL	-24...0...+24 [semitones]	40
nn	1E	1	00 - 7F	MW LOW PASS FILTER CONTROL	-9600...0...+9450[cent]	40
nn	1F	1	00 - 7F	MW AMPLITUDE CONTROL	-100...0...+100 [%]	40
nn	20	1	00 - 7F	MW LFO PMOD DEPTH	0...127	0A
nn	21	1	00 - 7F	MW LFO FMOD DEPTH	0...127	00
nn	22	1	00 - 7F	MW LFO AMOD DEPTH	0...127 (Not valid for VL)	00
nn	23	1	28 - 58	BEND PITCH CONTROL	-24...0...+24 [semitones]	42
nn	24	1	00 - 7F	BEND LOW PASS FILTER CONTROL	-9600...0...+9450 [cent]	40
nn	25	1	00 - 7F	BEND AMPLITUDE CONTROL	-100...0...+100 [%]	40
nn	26	1	00 - 7F	BEND LFO PMOD DEPTH	0...127	00
nn	27	1	00 - 7F	BEND LFO FMOD DEPTH	0...127	00
nn	28	1	00 - 7F	BEND LFO AMOD DEPTH	0...127 (Not valid for VL)	00
TOTAL SIZE			29			
nn	30	1	00 - 01	Rcv PITCH BEND	OFF, ON	01
nn	31	1	00 - 01	Rcv CH AFTER TOUCH (CAT)	OFF, ON	01
nn	32	1	00 - 01	Rcv PROGRAM CHANGE	OFF, ON	01
nn	33	1	00 - 01	Rcv CONTROL CHANGE	OFF, ON	01
nn	34	1	00 - 01	Rcv POLY AFTER TOUCH (PAT)	OFF, ON (Not valid for VL)	01
nn	35	1	00 - 01	Rcv NOTE MESSAGE	OFF, ON	01
nn	36	1	00 - 01	Rcv RPN	OFF, ON	01
nn	37	1	00 - 01	Rcv NRPN	OFF, ON	XGmode=01, GMmode=00
nn	38	1	00 - 01	Rcv MODURATION	OFF, ON	01
nn	39	1	00 - 01	Rcv VOLUME	OFF, ON	01
nn	3A	1	00 - 01	Rcv PAN	OFF, ON	01
nn	3B	1	00 - 01	Rcv EXPRESSION	OFF, ON	01
nn	3C	1	00 - 01	Rcv HOLD1	OFF, ON	01
nn	3D	1	00 - 01	Rcv PORTAMENTO	OFF, ON	01
nn	3E	1	00 - 01	Rcv SOSTENUTO	OFF, ON (Not valid for VL)	01
nn	3F	1	00 - 01	Rcv SOFT PEDAL	OFF, ON	01
nn	40	1	00 - 01	Rcv BANK SELECT	OFF, ON	XGmode=01, GMmode=00
nn	41	1	00 - 7F	SCALE TUNING C	-64...0...+63 [cent]	40
nn	42	1	00 - 7F	SCALE TUNING C#	-64...0...+63 [cent]	40
nn	43	1	00 - 7F	SCALE TUNING D	-64...0...+63 [cent]	40
nn	44	1	00 - 7F	SCALE TUNING D#	-64...0...+63 [cent]	40
nn	45	1	00 - 7F	SCALE TUNING E	-64...0...+63 [cent]	40

nn	46	1	00 - 7F	SCALE TUNING F	-64...0...+63 [cent]	40
nn	47	1	00 - 7F	SCALE TUNING F#	-64...0...+63 [cent]	40
nn	48	1	00 - 7F	SCALE TUNING G	-64...0...+63 [cent]	40
nn	49	1	00 - 7F	SCALE TUNING G#	-64...0...+63 [cent]	40
nn	4A	1	00 - 7F	SCALE TUNING A	-64...0...+63 [cent]	40
nn	4B	1	00 - 7F	SCALE TUNING A#	-64...0...+63 [cent]	40
nn	4C	1	00 - 7F	SCALE TUNING B	-64...0...+63 [cent]	40
nn	4D	1	28 - 58	CAT PITCH CONTROL	-24...0...+24 [semitones]	40
nn	4E	1	00 - 7F	CAT LOW PASS FILTER CONTROL	-9600...0...+9450[cent]	40
nn	4F	1	00 - 7F	CAT AMPLITUDE CONTROL	-100...0...+100 [%]	40
nn	50	1	00 - 7F	CAT LFO PMOD DEPTH	0...127	00
nn	51	1	00 - 7F	CAT LFO FMOD DEPTH	0...127	00
nn	52	1	00 - 7F	CAT LFO AMOD DEPTH	0...127 (Not valid for VL)	00
nn	53	1	28 - 58	PAT PITCH CONTROL	-24...0...+24 [semitones] (Not valid for VL)	40
nn	54	1	00 - 7F	PAT LOW PASS FILTER CONTROL	-9600...0...+9450 [cent] (Not valid for VL)	40
nn	55	1	00 - 7F	PAT AMPLITUDE CONTROL	-100...0...+100 [%] (Not valid for VL)	40
nn	56	1	00 - 7F	PAT LFO PMOD DEPTH	0...127 (Not valid for VL)	00
nn	57	1	00 - 7F	PAT LFO FMOD DEPTH	0...127 (Not valid for VL)	00
nn	58	1	00 - 7F	PAT LFO AMOD DEPTH	0...127 (Not valid for VL)	00
nn	59	1	00 - 5F	AC1 CONTROLLER NUMBER	0...95	10
nn	5A	1	28 - 58	AC1 PITCH CONTROL	-24...0...+24 [semitones]	40
nn	5B	1	00 - 7F	AC1 LOW PASS FILTER CONTROL	-9600...0...+9450 [cent]	40
nn	5C	1	00 - 7F	AC1 AMPLITUDE CONTROL	-100...0...+100 [%]	40
nn	5D	1	00 - 7F	AC1 LFO PMOD DEPTH	0...127	00
nn	5E	1	00 - 7F	AC1 LFO FMOD DEPTH	0...127	00
nn	5F	1	00 - 7F	AC1 LFO AMOD DEPTH	0...127 (Not valid for VL)	00
nn	60	1	00 - 5F	AC2 CONTROLLER NUMBER	0...95 (Not valid for VL)	11
nn	61	1	28 - 58	AC2 PITCH CONTROL	-24...0...+24 [semitones] (Not valid for VL)	40
nn	62	1	00 - 7F	AC2 LOW PASS FILTER CONTROL	-9600...0...+9450 [cent] (Not valid for VL)	40
nn	63	1	00 - 7F	AC2 AMPLITUDE CONTROL	-100...0...+100 [%] (Not valid for VL)	40
nn	64	1	00 - 7F	AC2 LFO PMOD DEPTH	0...127 (Not valid for VL)	00
nn	65	1	00 - 7F	AC2 LFO FMOD DEPTH	0...127 (Not valid for VL)	00
nn	66	1	00 - 7F	AC2 LFO AMOD DEPTH	0...127 (Not valid for VL)	00
nn	67	1	00 - 01	PORTAMENTO SWITCH	OFF, ON	00
nn	68	1	00 - 7F	PORTAMENTO TIME	0...127	00
nn	69	1	00 - 7F	PITCH EG INITIAL LEVEL	-64...0...+63	40
nn	6A	1	00 - 7F	PITCH EG ATTACK TIME	-64...0...+63	40
nn	6B	1	00 - 7F	PITCH EG RELEASE LEVEL	-64...0...+63	40
nn	6C	1	00 - 7F	PITCH EG RELEASE TIME	-64...0...+63	40
nn	6D	1	01 - 7F	VELOCITY LIMIT LOW	1...127 (Not valid for VL)	01
nn	6E	1	01 - 7F	VELOCITY LIMIT HIGH	1...127 (Not valid for VL)	7F
TOTAL SIZE		3F				
nn	70	1	28 - 58	BEND PITCH LOW CONTROL	-24...+24 [semitone] (VL only)	3E
nn	71	1	00 - 7F	FILTER EG DEPTH	-64...+63 (VL only)	40
nn	72	1	00 - 7F	EQ BASS GAIN	-12 - +12 [dB]	40
nn	73	1	00 - 7F	EQ TREBLE GAIN	-12 - +12 [dB]	40
TOTAL SIZE		4				
nn	74	1		NOT USED		--
nn	75	1		NOT USED		--
nn	76	1	04 - 28	EQ BASS FREQUENCY	32...2.0k [Hz] (Not valid for VL)	0C
nn	77	1	1C - 3A	EQ TREBLE FREQUENCY	500...16.0k [Hz] (Not valid for VL)	36
nn	78	1		NOT USED		--
nn	79	1		NOT USED		--
nn	7A	1		NOT USED		--

nn	7B	1		NOT USED		--
nn	7C	1		NOT USED		--
nn	7D	1		NOT USED		--
nn	7E	1		NOT USED		--
nn	7F	1		NOT USED		--
TOTAL SIZE		0C				

09	Op	00	1	00 - 01	NOTE ASSIGN	OFF/ON	01
		01	1		NOT USED		--
		02	1		NOT USED		--
		03	1	00 - 62	PRESSURE CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		04	1	00 - 7F	DEPTH	-64...+63	40
		05	1	00 - 62	EMBOUCHURE CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		06	1	00 - 7F	DEPTH	-64...+63	40
		07	1	00 - 62	TONGUING CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		08	1	00 - 7F	DEPTH	-64...+63	40
		09	1	00 - 62	SCREAM CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		0A	1	00 - 7F	DEPTH	-64...+63	40
		0B	1	00 - 62	BREATH NOISE CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		0C	1	00 - 7F	DEPTH	-64...+63	40
		0D	1	00 - 62	GROWL CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		0E	1	00 - 7F	DEPTH	-64...+63	40
		0F	1	00 - 62	THROAT FORMANT CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		10	1	00 - 7F	DEPTH	-64...+63	40
		11	1	00 - 62	HARMONIC ENHANCER CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		12	1	00 - 7F	DEPTH	-64...+63	40
		13	1	00 - 62	DAMPING CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		14	1	00 - 7F	DEPTH	-64...+63	40
		15	1	00 - 62	ABSORPTION CONTROL NO.	off - 95, AT, VELOCITY, PB	00
		16	1	00 - 7F	DEPTH	-64...+63	40
TOTAL SIZE							

p = Part Number (0 - F)  
The above block affects only VL.

0A	nn	10	1	00, 08, 28, 29	OUTPUT SELECT	0:stereo out, 8:indiv1+2 40:indiv1,41:indiv2	0
TOTAL SIZE		1					

If data other than the above is received, 0:stereo out will be selected.  
Note: In the case of OUTPUT SELECT, if the received value exceeds the number that can be supported, the parameter value will be 0.

0A	nn	20	1	00 - 7F	HIGH PASS FILTER CUTOFF FREQUENCY	-64...0...+63	40
	nn	21	1		NOT USED		--
TOTAL SIZE		2					

nn = PART NUMBER

- In the case of a DRUM PART, the following parameters will have no effect.
- BANK SELECT LSB
  - MONO/POLY MODE
  - SCALE TUNING
  - PORTAMENTO
  - PITCH EG
  - FILTER MODURATION DEPTH (FMOD DEPTH)
  - AMPLITUDE MODURATION DEPTH (AMOD DEPTH)
  - OUTPUT SELECT

< Table 1 - 10 >

MIDI Parameter Change table (A/D PART)						
Address (H)		Size (H)	Data (H)	Parameter	Description	Default value (H)
10	0n	00	1	00 - 01	INPUT GAIN	MIC , LINE 00

	01	1	00 - 7F	BANK SELECT MSB	0...127	00
	02	1	00 - 7F	BANK SELECT LSB	0...127	00
	03	1	00 - 7F	PROGRAM NUMBER	1...128	00
	04	1	00-1F, 7F	Rcv CHANNEL	A1...A16, B1...B16, OFF	7F
	05	1		NOT USED		--
	06	1		NOT USED		--
	07	1		NOT USED		--
	08	1		NOT USED		--
	09	1		NOT USED		--
	0A	1		NOT USED		--
	0B	1	00 - 7F	VOLUME	0...127	00
	0C	1		NOT USED		--
	0D	1		NOT USED		--
	0E	1	01 - 7F	PAN	L63...C...R63	40
	0F	1		NOT USED		--
	10	1		NOT USED		--
	11	1	00 - 7F	DRY LEVEL	0...127	7F
	12	1	00 - 7F	CHORUS SEND	0...127	00
	13	1	00 - 7F	REVERB SEND	0...127	00
	14	1	00 - 7F	VARIATION SEND	0...127	00
TOTAL SIZE		15				
10	On	30	1	NOT USED		--
		31	1	NOT USED		--
		32	1	00 - 01	Rcv PROGRAM CHANGE	OFF , ON
		33	1	00 - 01	Rcv CONTROL CHANGE	OFF , ON
		34	1		NOT USED	--
		35	1	00 - 01	MUTE	OFF , ON
		36	1		NOT USED	--
		37	1		NOT USED	--
		38	1		NOT USED	--
		39	1	00 - 01	Rcv VOLUME	OFF , ON
		3A	1	00 - 01	Rcv PAN	OFF , ON
		3B	1	00 - 01	Rcv EXPRESSION	OFF , ON
		3C	1		NOT USED	--
		3D	1		NOT USED	--
		3E	1		NOT USED	--
		3F	1		NOT USED	--
		40	1	00 - 01	Rcv BANK SELECT	OFF , ON
		41	1		NOT USED	--
		42	1		NOT USED	--
		43	1		NOT USED	--
		44	1		NOT USED	--
		45	1		NOT USED	--
		46	1		NOT USED	--
		47	1		NOT USED	--
		48	1		NOT USED	--
		49	1		NOT USED	--
		4A	1		NOT USED	--
		4B	1		NOT USED	--
		4C	1		NOT USED	--
		4D	1		NOT USED	--
		4E	1		NOT USED	--
		4F	1		NOT USED	--
		50	1		NOT USED	--
		51	1		NOT USED	--
		52	1		NOT USED	--
		53	1		NOT USED	--
		54	1		NOT USED	--
		55	1		NOT USED	--
		56	1		NOT USED	--
		57	1		NOT USED	--
		58	1		NOT USED	--

59	1	00 - 5F	AC1 CONTROLLER NUMBER	0...95	10
5A	1		NOT USED		--
5B	1		NOT USED		--
5C	1		NOT USED		--
5D	1		NOT USED		--
5E	1		NOT USED		--
5F	1		NOT USED		--
60	1	00 - 5F	AC2 CONTROLLER NUMBER	0...95	11
TOTAL SIZE	31				

n: A/D Part number (0 - 1)

< Table 1 - 11 >

MIDI Parameter Change table (A/D System)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
11 00 00	1	00 - 01	A/D1, 2 MONO/STEREO MODE	MONO/STEREO	00
TOTAL SIZE	1				

< Table 1 - 12 >

MIDI Parameter Change table (DRUM SETUP)

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
3n rr 00	1	00 - 7F	PITCH COARSE	-64...0...+63	40
01	1	00 - 7F	PITCH FINE	-64...0...+63 [cent]	40
02	1	00 - 7F	LEVEL	0...127	depend on the note
03	1	00 - 7F	ALTERNATE GROUP	OFF, 1...127	-
04	1	00 - 7F	PAN	RND, L63...C...R63	-
05	1	00 - 7F	REVERB SEND	0...127	-
06	1	00 - 7F	CHORUS SEND	0...127	-
07	1	00 - 7F	VARIATION SEND	0...127	7F
08	1	00 - 01	KEY ASSIGN	SINGLE, MULTI	00
09	1	00 - 01	Rcv NOTE OFF	OFF, ON	depend on the note
0A	1	00 - 01	Rcv NOTE ON	OFF, ON	01
0B	1	00 - 7F	LOW PASS FILTER CUTOFF FREQUENCY	-64...0...63	40
0C	1	00 - 7F	LOW PASS FILTER RESONANCE	-64...0...63	40
0D	1	00 - 7F	EG ATTACK RATE	-64...0...63	40
0E	1	00 - 7F	EG DECAY1 RATE	-64...0...63	40
0F	1	00 - 7F	EG DECAY2 RATE	-64...0...63	40
TOTAL SIZE	10				

3n rr 20	1	00 - 7F	EQ BASS GAIN	-12 - +12 [dB]	40
21	1	00 - 7F	EQ TREBLE GAIN	-12 - +12 [dB]	40
22	1		NOT USED		--
23	1		NOT USED		--
24	1	04 - 28	EQ BASS FREQUENCY	32...2.0k [Hz]	0C
25	1	1C - 3A	EQ TREBLE FREQUENCY	500...16.0k [Hz]	36
26	1		NOT USED		--
27	1		NOT USED		--
28	1		NOT USED		--
29	1		NOT USED		--
2A	1		NOT USED		--
2B	1		NOT USED		--
2C	1		NOT USED		--
2D	1		NOT USED		--
TOTAL SIZE	0E				

3n rr 40	1	00, 08, 28, 29	OUTPUT SELECT	0:stereo out, 8:indiv1+2 40:indiv1, 41:indiv2	0
TOTAL SIZE	1				

When data other than the above is received, 0:stereo out will be selected.



3n	rr	50	1	00 - 7F	HIGH PASS FILTER CUTOFF FREQUENCY	-64...0...63	40
		51	1		NOT USED		--
TOTAL SIZE		2					

3n	rr	60	1	30 - 50	VELOCITY SENSE PITCH	-16...0...16	depend on the note
		61	1	30 - 50	VELOCITY SENSE LPF CUTOFF	-16...0...16	-
TOTAL SIZE		2					

n:Drum Setup Number (0 - 3)  
rr:note number (0D - 5B)

In the following cases, the MU100R will initialize all Drum Setups.  
XG SYSTEM ON received  
GM SYSTEM ON received  
DRUM SETUP RESET received (when in XG mode)

[Note]  
When a part to which a Drum Setup is assigned receives a program change, the assigned Drum Setup will be initialized.

If the same Drum Setup is assigned to two or more parts, changes in Drum Setup parameters (including program changes) will apply to all parts to which it is assigned.

< Table 1 - 13 >

MIDI Parameter Change table (PART ASSIGN)

Address	Size	Data	Parameter	Description	Default value
(H)	(H)	(H)			(H)
70 00 00	1	00 - 0F, 7F	VL PART ASSIGN	PART 1...16, OFF	0
TOTAL SIZE		1			

< Table 2 - 1 >

Parmeter Bass Address  
Model ID = 49

Parameter	Address			Description
	(H)	(M)	(L)	
MU100 SYSTEM	00	00	00	System
REMOTE SWITCH	0A	00	00	Remote Switch
MU80 INTERNAL PERFORMANCE	30	00	00	#1 Common
	30	63	00	#100 Common
	31	00	00	#1 Part1
	:	:	:	:
	31	63	00	#100 Part1
	32	00	00	#1 Part2
	:	:	:	:
	32	63	00	#100 Part2
	33	00	00	#1 Part3
	:	:	:	:
	33	63	00	#100 Part3
	34	00	00	#1 Part4
	:	:	:	:
	34	63	00	#100 Part4

MU80 Performance Common INT

Address (H)			Parameter
30	pp	00	System
	pp	20	Effect
	pp	70	EQ

pp:Performance#

< Table 2 - 2 >

MIDI Parameter Change table (MU100 SYSTEM)

Address	Size	Data	Parameter	Description	Default value
(H)	(H)	(H)			(H)
00 00 00	1	00 - 01	MUTE LOCK	OFF, ON	00
	01	1	AD LOCK	OFF, ON	00
	02	1	EQ LOCK	OFF, ON	00
	03	1	Rcv GM EXCLUSIVE MESSAGE	OFF, ON	01
	04	1	Rcv BANK SELECT	OFF, ON	01

05	1	00 - 04	BULK OUT INTERVAL TIME	50, 100, 150, 200, 300	02
06	1	00 - 0F	PERFORMANCE SYSTEM CHANNEL	1...16	00
07	1	28 - 58	PERFORMANCE SYSTEM TRANSPOSE	-24...0...+24 [semitone]	40
08	1	00 - 07	LCD CONTRAST	1...8	01
09	1	00 - 07	MULTI PORT NUMBER for MIDI OUT	1...8	00
TOTAL SIZE		0A			
00 00 10	1	00 - 01	DRUM EDIT Rcv NOTE	OFF, ON	01
TOTAL SIZE		1			
00 00 11	1	00 - 01	OUTPUT SELECT LOCK	OFF, ON	00
TOTAL SIZE		1			
OUTPUT SELECT LOCK is only for the MU100R.					
00 00 12	1	00 - 01	VOICE MAP	MU basic, MU100 Native	01
TOTAL SIZE		1			

< Table 2 - 3 >

MIDI Parameter Change table(REMOTE SWITCH)					
Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
0A 00 00	1	00-01	PLAY SWITCH	OFF, ON	--
	01	1	UTIL SWITCH	OFF, ON	--
	02	1	MODE SWITCH	OFF, ON	--
	03	1	EDIT SWITCH	OFF, ON	--
	04	1	EFFECT SWITCH	OFF, ON	--
	05	1	EQ SWITCH	OFF, ON	--
	06	1	MUTE/SOLO SWITCH	OFF, ON	--
	07	1	ENTER SWITCH	OFF, ON	--
	08	1	EXIT SWITCH	OFF, ON	--
	09	1	PART- SWITCH	OFF, ON	--
	0A	1	SELECT- SWITCH	OFF, ON	--
	0B	1	VALUE- SWITCH	OFF, ON	--
	0C	1	PART+ SWITCH	OFF, ON	--
	0D	1	SELECT+ SWITCH	OFF, ON	--
	0E	1	VALUE+ SWITCH	OFF, ON	--
TOTAL SIZE		0F			

< Table 2 - 4 >

MIDI Parameter Change table (MU80, MU50 INTERNAL PERFORMANCE)					
Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
30 pp 00	0C	20 - 7F	PERFORMANCE NAME	32...127 (ASCII CHARACTER)	depends on performance number
pp 0C	01	00 - 7F	PERFORMANCE VOLUME	0...127	-
pp 0D	01	01 - 7F	PERFORMANCE PAN	L63...C...R63 (1...64...127)	-
pp 0E	01	00 - 60	AC1 CC NUMBER	0...95, CAT (96)	-
pp 0F	01	00 - 01	A/D INPUT	OFF, ON	-
TOTAL SIZE		10			
30 pp 20	2	00-7F	REVERB TYPE MSB	refer to Effect Program List	depends on performance number
pp 21		00-7F	REVERB TYPE LSB	-	-
pp 22	1	00-7F	REVERB PARAMETER 1	-	-
pp 23	1	00-7F	REVERB PARAMETER 2	-	-
pp 24	1	00-7F	REVERB PARAMETER 3	-	-
pp 25	1	00-7F	REVERB PARAMETER 4	-	-
pp 26	1	00-7F	REVERB PARAMETER 5	-	-
pp 27	1	00-7F	REVERB RETURN	-∞0dB...0dB...+6dB (0...96...127)	-
pp 28	1	01-7F	REVERB PAN	L63...C...R63	-
pp 29	2	00-7F	CHORUS TYPE MSB	refer to Effect Program List	-
pp 2A		00-7F	CHORUS TYPE LSB	-	-
pp 2B	1	00-7F	CHORUS PARMETER 1	-	-
pp 2C	1	00-7F	CHORUS PARMETER 2	-	-

pp	2D	1	00-7F	CHORUS PARMETER 3	-	-
pp	2E	1	00-7F	CHORUS PARMETER 4	-	-
pp	2F	1	00-7F	CHORUS PARMETER 5	-	-
pp	30	1	00-7F	CHORUS RETURN	-∞ΩdB...0dB...+6dB (0...96...127)	-
pp	31	1	01-7F	CHORUS PAN	L63...C...R63	-
pp	32	1	00-7F	SEND CHORUS TO REVERB	-∞ΩdB...0dB...+6dB (0...96...127)	-
pp	33	2	00-7F	VARIATION TYPE MSB	refer to Effect Program List	-
pp	34		00-7F	VARIATION TYPE LSB	-	-
pp	35	2	00-7F	VARIATION PARMETER 1 MSB	-	-
pp	36		00-7F	VARIATION PARMETER 1 LSB	-	-
pp	37	2	00-7F	VARIATION PARMETER 2 MSB	-	-
pp	38		00-7F	VARIATION PARMETER 2 LSB	-	-
pp	39	2	00-7F	VARIATION PARMETER 3 MSB	-	-
pp	3A		00-7F	VARIATION PARMETER 3 LSB	-	-
pp	3B	2	00-7F	VARIATION PARMETER 4 MSB	-	-
pp	3C		00-7F	VARIATION PARMETER 4 LSB	-	-
pp	3D	2	00-7F	VARIATION PARMETER 5 MSB	-	-
pp	3E		00-7F	VARIATION PARMETER 5 LSB	-	-
pp	3F	2	00-7F	VARIATION PARMETER 10 MSB	-	-
pp	40		00-7F	VARIATION PARMETER 10 LSB	-	-
pp	41	1	00-7F	VARIATION RETURN	-∞ΩdB...0dB...+6dB (0...96...127)	-
pp	42	1	01-7F	VARIATION PAN	L63...C...R63 (1...64...127)	-
pp	43	1	00-7F	SEND VARIATION TO REVERB	-∞ΩdB...0dB...+6dB (0...96...127)	-
pp	44	1	00-7F	SEND VARIATION TO CHORUS	-∞ΩdB...0dB...+6dB (0...96...127)	-
pp	45	1	00-7F	AC1 VARIATION CONTROL DEPTH	0...127	-
pp	46	1	00-01	VARIATION CONNECTION	INSERTION , SYSTEM	-
pp	47	1	00-7F	VARATION PART	Part1...4 (0...3)	-
					AD1, AD2 (64, 65)	-
					OFF (127)	-
pp	48	2	00-7F	INSERTION EFFECT 1 TYPE MSB	refer to Effect Program List	-
pp	49		00-7F	INSERTION EFFECT 1 TYPE LSB	-	-
pp	4A	1	00-7F	INSERTION EFFECT 1 PARAMETER1	-	-
pp	4B	1	00-7F	INSERTION EFFECT 1 PARAMETER2	-	-
pp	4C	1	00-7F	INSERTION EFFECT 1 PARAMETER3	-	-
pp	4D	1	00-7F	INSERTION EFFECT 1 PARAMETER4	-	-
pp	4E	1	00-7F	INSERTION EFFECT 1 PARAMETERS	-	-
pp	4F	1	00-7F	INSERTION EFFECT 1 PARAMETER10	-	-
pp	50	1	00-7F	INSERTION EFFECT 1 PART	Part1...4 (0...3)	-
					AD1, AD2 (64, 65)	-
					OFF (127)	-
TOTAL SIZE		31				

MIDI Parameter Change table (INTERNAL PERFORMANCE COMMON EQ)

Address	Size	Data	Parameter	Description	Default value
(H)	(H)	(H)			(H)
30 pp 70	1	00 - 04	EQ TYPE	flat, jazz, pops, rock, concert	depends on performance number
pp 71	1	34 - 4C	EQ GAIN1	-12...0...+12 [dB]	-
pp 72	1	34 - 4C	EQ GAIN2	-12...0...+12 [dB]	-
pp 73	1	34 - 4C	EQ GAIN3	-12...0...+12 [dB]	-
pp 74	1	34 - 4C	EQ GAIN4	-12...0...+12 [dB]	-
pp 75	1	34 - 4C	EQ GAIN5	-12...0...+12 [dB]	-
TOTAL SIZE		06			
3n pp 00	1	00 - 7F	PROGRAM NUMBER	1...128	depends on performance number
3n pp 01	1	00 - 7F	BANK SELECT	0...127 (refer to XG voice map)	-
3n pp 02	1	00 - 7F	VOLUME	0...127	-
3n pp 03	1	00, 01 - 7F	PAN	RND, L63...C...R63	-
3n pp 04	1	00 - 7F	DRY SEND LEVEL	0...127	-
3n pp 05	1	00 - 7F	CHORUS SEND	0...127	-
3n pp 06	1	00 - 7F	REVERB SEND	0...127	-
3n pp 07	1	00 - 7F	VARIATION SEND	0...127	-
3n pp 08	1	28 - 58	NOTE SHIFT	-24...0...+24 [semitones]	-
3n pp 09	1	00 - 7F	LOW PASS FILTER CUTOFF FREQUENCY	-64...0...+63	-

3n	pp	0A	1	00 - 7F	LOW PASS FILTER RESONANCE	-64...0...+63	-
3n	pp	0B	1	00 - 7F	EG ATTACK TIME	-64...0...+63	-
3n	pp	0C	1	00 - 7F	EG DECAY TIME	-64...0...+63	-
3n	pp	0D	1	00 - 7F	EG RELEASE TIME	-64...0...+63	-
3n	pp	0E	1	00 - 7F	VIBRATO RATE	-64...0...+63	-
3n	pp	0F	1	00 - 7F	VIBRATO DEPTH	-64...0...+63	-
3n	pp	10	1	00 - 7F	VIBRATO DELAY	-64...0...+63	-
3n	pp	11	2	00 - 0F	DETUNE	-12.8...0...+12.7 [Hz]	-
3n	pp	11		00 - 0F		1st bit3-0→bit7-4	
						2nd bit3-0→bit3-0	
					Rcv NOTE MESSAGE	1st bit6: OFF, ON (0,1)	
					MONO/POLY MODE	1st bit5: MONO, POLY (0,1)	
					PORTAMENTO SWITCH	* 1st bit4: OFF, ON (0,1)	
3n	pp	13	1	00 - 7F	PITCH EG INITIAL LEVEL	0...127	-
3n	pp	14	1	00 - 7F	PITCH EG ATTACK TIME	0...127	-
3n	pp	15	1	00 - 7F	PITCH EG RELEASE LEVEL	0...127	-
3n	pp	16	1	00 - 7F	PITCH EG RELEASE TIME	0...127	-
3n	pp	17	1	00 - 7F	MW LFO PMOD DEPTH	* 0...127	-
3n	pp	18	1	00 - 7F	MW LFO FMOD DEPTH	* 0...127	-
3n	pp	19	1	28 - 58	PITCH BEND CONTROL	* -24...0...+24 [semitones]	-
3n	pp	1A	1	00 - 7F	AC1 LOW PASS FILTER CONTROL	* -64...0...63	-
3n	pp	1B	1	00 - 7F	AC1 AMPLITUDE CONTROL	* -100...0...+100 [%]	-
3n	pp	1C	1	00 - 7F	VELOCITY SENSE DEPTH	0...127	-
3n	pp	1D	1	00 - 7F	VELOCITY SENSE OFFSET	0...127	-
3n	pp	1E	1	00 - 7F	NOTE LIMIT LOW	C-2...G8	-
3n	pp	1F	1	00 - 7F	NOTE LIMIT HIGH	C-2...G8	-
3n	pp	20	1	00 - 7F	PORTAMENTO TIME	* 0...127	-
3n	pp	21	1	01 - 7F	VELOCITY LIMIT LOW	1...127	-
3n	pp	22	1	01 - 7F	VELOCITY LIMIT HIGH	1...127	-
TOTAL SIZE				23			

n: performance part number (01-04)  
pp: performance number (00-63)  
Parameters marked by \* will receive only the n=1 data as Common data, and will not receive the n = 2~4 data.

< Table 3 - 1 >

Parameter Base Address  
Model ID = 59

Parameter	Address			Description
	(H)	(M)	(L)	
CURRENT PERFORMANCE	09	00	00	Part1
	09	01	00	Part2
	09	02	00	Part3
	09	03	00	Part4
	0B	00	00	Common
	0C	00	00	Insertion1 Effect
	0C	01	00	Insertion2 Effect
INTERNAL PERFORMANCE	30	00	00	#1 Part1
		:		:
	30	63	00	#100 Part1
	31	00	00	#1 Part2
		:		:
	31	63	00	#100 Part2
	32	00	00	#1 Part3
		:		:
	32	63	00	#100 Part3
	33	00	00	#1 Part4
		:		:
	33	63	00	#100 Part4

Performance Common INT

Address (H)		Parameter
40	pp	00 System
pp	20	Effect
pp	70	EQ

pp:Performance#

INTERNAL PERFORMANCE (Continued)	40	00	00	#1 Common	Performance Common CUR
		:		:	
	40	63	00	#100 Common	
	50	00	00	#1 Insertion1 Effect	
		:		:	
	50	63	00	#100 Insertion1 Effect	
	51	00	00	#1 Insertion2 Effect	
		:		:	
	51	63	00	#100 Insertion2 Effect	
	60	00	00	#1 Plugin Board1	
		:		:	
	60	63	00	#100 Plugin Board1	
	61	00	00	#1 Plugin Board2	Address (H)   Parameter
		:		:	
	61	63	00	#100 Plugin Board2	
					0B   00   00 System
					00   20   Effect
					00   70   EQ

< Table 3 - 2 >

MIDI Parameter Change table (CURRENT PERFORMANCE)

Address (H)		Size (H)	Data (H)	Parameter	Description	Default value (H)
09	On	00	1	00 - 7F	PROGRAM NUMBER	1...128
	On	01	1		NOT USED	--
	On	02	1	00 - 7F	VOLUME	0...127
	On	03	1	00 - 7F	PAN	RND,L63...C...R63 (0, 1...64...127)
	On	04	1	00 - 7F	DRY SEND LEVEL	0...127
	On	05	1	00 - 7F	CHORUS SEND	0...127
	On	06	1	00 - 7F	REVERB SEND	0...127
	On	07	1	00 - 7F	VARIATION SEND	0...127
	On	08	1	28 - 58	NOTE SHIFT	-24...0...+24 [semitones]
	On	09	1	00 - 01	Rcv NOTE MESSAGE (MUTE)	OFF , ON (0, 1)
	On	0A	1	00 - 7F	LOW PASS FILTER CUTOFF FREQUENCY	-64...0...+63
	On	0B	1	00 - 7F	LOW PASS FILTER RESONANCE	-64...0...+63
	On	0C	1	00 - 7F	EG ATTACK TIME	-64...0...+63
	On	0D	1	00 - 7F	EG DECAY TIME	-64...0...+63
	On	0E	1	00 - 7F	EG RELEASE TIME	-64...0...+63
	On	0F	1	00 - 7F	VIBRATO RATE	-64...0...+63
	On	10	1	00 - 7F	VIBRATO DEPTH	-64...0...+63
	On	11	1	00 - 7F	VIBRATO DELAY	-64...0...+63
	On	12	2	00 - 0F	DETUNE	-12.8...0...+12.7[Hz]
	On	13		00 - 0F	1st bit3-0→bit7-4	
					2nd bit3-0→bit3-0	
	On	14	1	00 - 7F	PITCH EG INITIAL LEVEL	-64...0...+63
	On	15	1	00 - 7F	PITCH EG ATTACK TIME	-64...0...+63
	On	16	1	00 - 7F	PITCH EG RELEASE LEVEL	-64...0...+63
	On	17	1	00 - 7F	PITCH EG RELEASE TIME	-64...0...+63
	On	18	1	00 - 01	MONO/POLY MODE	MONO , POLY (0, 1)
	On	19	1	00 - 7F	VELOCITY SENSE DEPTH	0...127
	On	1A	1	00 - 7F	VELOCITY SENSE OFFSET	0...127
	On	1B	1	00 - 7F	NOTE LIMIT LOW	C-2...G8 (0...127)
	On	1C	1	00 - 7F	NOTE LIMIT HIGH	C-2...G8 (0...127)
	On	1D	1	01 - 7F	VELOCITY LIMIT LOW	1...127
	On	1E	1	01 - 7F	VELOCITY LIMIT HIGH	1...127
	On	1F	1	00 - 7F	EQ BASS	-64 ...0...+63 (-12 - +12 [dB])
	On	20	1	00 - 7F	EQ TREBLE	-64 ...0...+63 (-12 - +12 [dB])
	On	21	1	04 - 28	EQ BASS frequency	32...2.0k [Hz]
	On	22	1	1C - 3A	EQ TREBLE frequency	500...16.0k [Hz]
	On	23	1	00 - 7F	HIGH PASS FILTER CUTOFF FREQUENCY	-64...0...+63
	On	24	2	00 - 7F	BANK SELECT MSB	0...127
	On	25		00 - 7F	BANK SELECT LSB	0...127
TOTAL SIZE		26				

n: performance part number (00-03)

0B	00	00	0C	20 - 7F	PERFORMANCE NAME	32...127 (ASCII CHARACTER)	depends on performance number
		0C	01	00 - 7F	PERFORMANCE VOLUME	0...127	-
		0D	01	01 - 7F	PERFORMANCE PAN	L63...C...R63	-
		0E	01	00 - 60	AC1 CC NUMBER	0...95, CAT	-
		0F	01	00 - 01	A/D INPUT	OFF, ON	-
		10	01	00 - 7F	MW LFO PMOD DEPTH	0...127	-
		11	01	00 - 7F	MW LFO FMOD DEPTH	0...127	-
		12	01	28 - 58	BEND PITCH CONTROL	-24...0...+24 [semitones]	-
		13	01	00 - 7F	AC1 LOW PASS FILTER CONTROL	-64 ...0...+63	-
		14	01	00 - 7F	AC1 AMPLITUDE CONTROL	-64 ...0...+63	-
		15	01	00 - 7F	AC1 LFO FMOD DEPTH	0...127	-
		16	01	00 - 01	PORTAMENTO SWITCH	OFF, ON (0, 1)	-
		17	01	00 - 7F	PORTAMENTO TIME	0...127	-
TOTAL SIZE				18			
0B	00	20	2	00-7F	REVERB TYPE MSB	refer to Effect Program List	depends on performance number
		21		00-7F	REVERB TYPE LSB	-	-
		22	1	00-7F	REVERB PARAMETER 1	-	-
		23	1	00-7F	REVERB PARAMETER 2	-	-
		24	1	00-7F	REVERB PARAMETER 3	-	-
		25	1	00-7F	REVERB PARAMETER 4	-	-
		26	1	00-7F	REVERB PARAMETER 5	-	-
		27	1	00-7F	REVERB RETURN	-∞dB...0dB...+6dB (0...96...127)	-
		28	1	01-7F	REVERB PAN	L63...C...R63	-
		29	2	00-7F	CHORUS TYPE MSB	refer to Effect Program List	-
		2A		00-7F	CHORUS TYPE LSB	-	-
		2B	1	00-7F	CHORUS PARAMETER 1	-	-
		2C	1	00-7F	CHORUS PARAMETER 2	-	-
		2D	1	00-7F	CHORUS PARAMETER 3	-	-
		2E	1	00-7F	CHORUS PARAMETER 4	-	-
		2F	1	00-7F	CHORUS PARAMETER 5	-	-
		30	1	00-7F	CHORUS RETURN	-∞dB...0dB...+6dB (0...96...127)	-
		31	1	01-7F	CHORUS PAN	L63...C...R63 (1...64...127)	-
		32	1	00-7F	SEND CHORUS TO REVERB	-∞dB...0dB...+6dB (0...96...127)	-
		33	2	00-7F	VARIATION TYPE MSB	refer to Effect Program List	-
		34		00-7F	VARIATION TYPE LSB	-	-
		35	2	00-7F	VARIATION PARAMETER 1 MSB	-	-
		36		00-7F	VARIATION PARAMETER 1 LSB	-	-
		37	2	00-7F	VARIATION PARAMETER 2 MSB	-	-
		38		00-7F	VARIATION PARAMETER 2 LSB	-	-
		39	2	00-7F	VARIATION PARAMETER 3 MSB	-	-
		3A		00-7F	VARIATION PARAMETER 3 LSB	-	-
		3B	2	00-7F	VARIATION PARAMETER 4 MSB	-	-
		3C		00-7F	VARIATION PARAMETER 4 LSB	-	-
		3D	2	00-7F	VARIATION PARAMETER 5 MSB	-	-
		3E		00-7F	VARIATION PARAMETER 5 LSB	-	-
		3F	2	00-7F	VARIATION PARAMETER 10 MSB	-	-
		40		00-7F	VARIATION PARAMETER 10 LSB	-	-
		41	1	00-7F	VARIATION RETURN	-∞dB...0dB...+6dB (0...96...127)	-
		42	1	01-7F	VARIATION PAN	L63...C...R63	-
		43	1	00-7F	SEND VARIATION TO REVERB	-∞dB...0dB...+6dB (0...96...127)	-
		44	1	00-7F	SEND VARIATION TO CHORUS	-∞dB...0dB...+6dB (0...96...127)	-
		45	1	00-7F	AC1 VARIATION CONTROL DEPTH	0...127	-
		46	1	00-01	VARIATION CONNECTION	INSERTION , SYSTEM	-
		47	1	00-7F	VARIATION PART	Part1...4 (0...3)	-
					AD1, AD2 (64, 65)		
					OFF (127)		
TOTAL SIZE				28			
0B	00	70	1	00 - 04	EQ TYPE	flat, jazz, pops, rock, concert	depends on performance number
		71	1	34 - 4C	EQ GAIN1	-12...0...+12 [dB]	-
		72	1	34 - 4C	EQ GAIN2	-12...0...+12 [dB]	-
		73	1	34 - 4C	EQ GAIN3	-12...0...+12 [dB]	-

		74	1	34 - 4C	EQ GAIN4	-12...0...+12 [dB]	-
		75	1	34 - 4C	EQ GAIN5	-12...0...+12 [dB]	-
TOTAL SIZE		06					
0C	00	00	2	00-7F	INSERTION EFFECT 1 TYPE MSB	refer to Effect Program List	depends on performance number
		01		00-7F	INSERTION EFFECT 1 TYPE LSB	-	-
	02	02	2	00-7F	INSERTION EFFECT 1 PARAMETER1 MSB	-	-
		03		00-7F	INSERTION EFFECT 1 PARAMETER1 LSB	-	-
	04	04	2	00-7F	INSERTION EFFECT 1 PARAMETER2 MSB	-	-
		05		00-7F	INSERTION EFFECT 1 PARAMETER2 LSB	-	-
	06	06	2	00-7F	INSERTION EFFECT 1 PARAMETER3 MSB	-	-
		07		00-7F	INSERTION EFFECT 1 PARAMETER3 LSB	-	-
	08	08	2	00-7F	INSERTION EFFECT 1 PARAMETER4 MSB	-	-
		09		00-7F	INSERTION EFFECT 1 PARAMETER4 LSB	-	-
	0A	0A	2	00-7F	INSERTION EFFECT 1 PARAMETER5 MSB	-	-
		0B		00-7F	INSERTION EFFECT 1 PARAMETER5 LSB	-	-
	0C	0C	2	00-7F	INSERTION EFFECT 1 PARAMETER10 MSB	-	-
		0D		00-7F	INSERTION EFFECT 1 PARAMETER10 LSB	-	-
	0E	0E	1	00-7F	INSERTION EFFECT 1 PART	Part1...4 (0...3) AD1, AD2 (64, 65) OFF (127)	-
TOTAL SIZE		0F					
0C	01	00	2	00-7F	INSERTION EFFECT 2 TYPE MSB	refer to Effect Program List	depends on performance number
		01		00-7F	INSERTION EFFECT 2 TYPE LSB	-	-
	02	02	2	00-7F	INSERTION EFFECT 2 PARAMETER1 MSB	-	-
		03		00-7F	INSERTION EFFECT 2 PARAMETER1 LSB	-	-
	04	04	2	00-7F	INSERTION EFFECT 2 PARAMETER2 MSB	-	-
		05		00-7F	INSERTION EFFECT 2 PARAMETER2 LSB	-	-
	06	06	2	00-7F	INSERTION EFFECT 2 PARAMETER3 MSB	-	-
		07		00-7F	INSERTION EFFECT 2 PARAMETER3 LSB	-	-
	08	08	2	00-7F	INSERTION EFFECT 2 PARAMETER4 MSB	-	-
		09		00-7F	INSERTION EFFECT 2 PARAMETER4 LSB	-	-
	0A	0A	2	00-7F	INSERTION EFFECT 2 PARAMETER5 MSB	-	-
		0B		00-7F	INSERTION EFFECT 2 PARAMETER5 LSB	-	-
	0C	0C	2	00-7F	INSERTION EFFECT 2 PARAMETER10 MSB	-	-
		0D		00-7F	INSERTION EFFECT 2 PARAMETER10 LSB	-	-
	0E	0E	1	00-7F	INSERTION EFFECT 2 PART	Part1...4 (0...3) AD1, AD2 (64, 65) OFF (127)	-
TOTAL SIZE		0F					

< Table 3 - 3 >

MIDI Parameter Change table (INTERNAL PERFORMANCE)						
Address (H)		Size (H)	Data (H)	Parameter	Description	Default value (H)
3n	pp	00	1	00 - 7F	PROGRAM NUMBER	1...128 depends on performance number
3n	pp	01	1	00 - 7F	BANK SELECT	0...127
3n	pp	02	1	00 - 7F	VOLUME	0...127
3n	pp	03	1	"00,01-7F"	PAN	RND, L63...C...R63
3n	pp	04	1	00 - 7F	DRY SEND LEVEL	0...127
3n	pp	05	1	00 - 7F	CHORUS SEND	0...127
3n	pp	06	1	00 - 7F	REVERB SEND	0...127
3n	pp	07	1	00 - 7F	VARIATION SEND	0...127
3n	pp	08	1	28 - 58	NOTE SHIFT	-24...0...+24 [semitones]
3n	pp	09	1	00 - 7F	LOW PASS FILTER CUTOFF FREQUENCY	-64...0...+63
3n	pp	0A	1	00 - 7F	LOW PASS FILTER RESONANCE	-64...0...+63
3n	pp	0B	1	00 - 7F	EG ATTACK TIME	-64...0...+63
3n	pp	0C	1	00 - 7F	EG DECAY TIME	-64...0...+63
3n	pp	0D	1	00 - 7F	EG RELEASE TIME	-64...0...+63
3n	pp	0E	1	00 - 7F	VIBRATO RATE	-64...0...+63
3n	pp	0F	1	00 - 7F	VIBRATO DEPTH	-64...0...+63

3n	pp	10	1	00 - 7F	VIBRATO DELAY	-64...0...+63	-
3n	pp	11	2	00 - 0F	DETUNE	-12.8...0...+12.7 [Hz]	-
3n	pp	12		00 - 7F		1st bit3-0→bit7-4	
						2nd bit3-0→bit3-0	
					Rcv NOTE MESSAGE	1st bit6: OFF, ON (0, 1)	
					MONO/POLY MODE	1st bit5: MONO, POLY (0, 1)	
3n	pp	13	1	00 - 7F	PITCH EG INITIAL LEVEL	0...127	-
3n	pp	14	1	00 - 7F	PITCH EG ATTACK TIME	0...127	-
3n	pp	15	1	00 - 7F	PITCH EG RELEASE LEVEL	0...127	-
3n	pp	16	1	00 - 7F	PITCH EG RELEASE TIME	0...127	-
3n	pp	17	1	00 - 7F	VELOCITY SENSE DEPTH	0...127	-
3n	pp	18	1	00 - 7F	VELOCITY SENSE OFFSET	0...127	-
3n	pp	19	1	00 - 7F	NOTE LIMIT LOW	C-2...G8	-
3n	pp	1A	1	00 - 7F	NOTE LIMIT HIGH	C-2...G8	-
3n	pp	1B	1	01 - 7F	VELOCITY LIMIT LOW	1...127	-
3n	pp	1C	1	01 - 7F	VELOCITY LIMIT HIGH	1...127	-
3n	pp	1D	1	00 - 7F	EQ BASS	-64...0...+63 (-12 - +12 [dB])	-
3n	pp	1E	1	00 - 7F	EQ TREBLE	-64...0...+63 (-12 - +12 [dB])	-
3n	pp	1F	1	04 - 28	EQ BASS frequency	32...2.0k [Hz]	-
3n	pp	20	1	1C - 3A	EQ TREBLE frequency	500...16.0k [Hz]	-
3n	pp	21	1	00 - 7F	HIGH PASS FILTER CUTOFF FREQUENCY	-64...0...+63	-
TOTAL SIZE				22			
3n	pp	30	2	00 - 7F	BANK SELECT MSB	0...127	depends on performance number
3n	pp			00 - 7F	BANK SELECT LSB	0...127	-
TOTAL SIZE				2			
n: performance part number					(00-03)		
pp:performance number					(00-63)		
40	pp	00	0C	20 - 7F	PERFORMANCE NAME	32...127 (ASCII CHARACTER)	depends on performance number
	pp	0C	01	00 - 7F	PERFORMANCE VOLUME	0...127	-
	pp	0D	01	01 - 7F	PERFORMANCE PAN	L63...C...R63 (1...64...127)	-
	pp	0E	01	00 - 60	AC1 CC NUMBER	0...95, CAT	-
	pp	0F	01	00 - 01	A/D INPUT	OFF, ON	-
	pp	10	01	00 - 7F	MW LFO PMOD DEPTH	0...127	-
	pp	11	01	00 - 7F	MW LFO FMOD DEPTH	0...127	-
	pp	12	01	28 - 58	BEND PITCH CONTROL	-24...0...+24 [semitones]	-
	pp	13	01	00 - 7F	AC1 FILTER CONTROL	-64...0...+63	-
	pp	14	01	00 - 7F	AC1 AMPLITUDE CONTROL	-100...0...+100 [%]	-
	pp	15	01	00 - 7F	AC1 LFO FMOD DEPTH	0...127	-
	pp	16	01	00 - 01	PORTAMENTO SWITCH	OFF, ON (0, 1)	-
	pp	17	01	00 - 7F	PORTAMENTO TIME	0...127	-
TOTAL SIZE				18			
40	pp	20	2	00-7F	REVERB TYPE MSB	refer to Effect Program List	depends on performance number
	pp	21		00-7F	REVERB TYPE LSB	-	-
	pp	22	1	00-7F	REVERB PARAMETER 1	-	-
	pp	23	1	00-7F	REVERB PARAMETER 2	-	-
	pp	24	1	00-7F	REVERB PARAMETER 3	-	-
	pp	25	1	00-7F	REVERB PARAMETER 4	-	-
	pp	26	1	00-7F	REVERB PARAMETER 5	-	-
	pp	27	1	00-7F	REVERB RETURN	-∞dB...0dB...+6dB (0...96...127)	-
	pp	28	1	01-7F	REVERB PAN	L63...C...R63	-
	pp	29	2	00-7F	CHORUS TYPE MSB	refer to Effect Program List	-
	pp	2A		00-7F	CHORUS TYPE LSB	-	-
	pp	2B	1	00-7F	CHORUS PARMETER 1	-	-
	pp	2C	1	00-7F	CHORUS PARMETER 2	-	-
	pp	2D	1	00-7F	CHORUS PARMETER 3	-	-
	pp	2E	1	00-7F	CHORUS PARMETER 4	-	-
	pp	2F	1	00-7F	CHORUS PARMETER 5	-	-
	pp	30	1	00-7F	CHORUS RETURN	-∞dB...0dB...+6dB (0...96...127)	-
	pp	31	1	01-7F	CHORUS PAN	L63...C...R63	-



	pp	32	1	00-7F	SEND CHORUS TO REVERB	-∞dB...0dB...+6dB (0...96...127)	-
	pp	33	2	00-7F	VARIATION TYPE MSB	refer to Effect Program List	-
	pp	34		00-7F	VARIATION TYPE LSB	-	-
	pp	35	2	00-7F	VARIATION PARMETER 1 MSB	-	-
	pp	36		00-7F	VARIATION PARMETER 1 LSB	-	-
	pp	37	2	00-7F	VARIATION PARMETER 2 MSB	-	-
	pp	38		00-7F	VARIATION PARMETER 2 LSB	-	-
	pp	39	2	00-7F	VARIATION PARMETER 3 MSB	-	-
	pp	3A		00-7F	VARIATION PARMETER 3 LSB	-	-
	pp	3B	2	00-7F	VARIATION PARMETER 4 MSB	-	-
	pp	3C		00-7F	VARIATION PARMETER 4 LSB	-	-
	pp	3D	2	00-7F	VARIATION PARMETER 5 MSB	-	-
	pp	3E		00-7F	VARIATION PARMETER 5 LSB	-	-
	pp	3F	2	00-7F	VARIATION PARMETER 10 MSB	-	-
	pp	40		00-7F	VARIATION PARMETER 10 LSB	-	-
	pp	41	1	00-7F	VARIATION RETURN	-∞dB...0dB...+6dB (0...96...127)	-
	pp	42	1	01-7F	VARIATION PAN	L63...C...R63 (1...64...127)	-
	pp	43	1	00-7F	SEND VARIATION TO REVERB	-∞dB...0dB...+6dB (0...96...127)	-
	pp	44	1	00-7F	SEND VARIATION TO CHORUS	-∞dB...0dB...+6dB (0...96...127)	-
	pp	45	1	00-7F	AC1 VARIATION CONTROL DEPTH	0...127	-
	pp	46	1	00-01	VARIATION CONNECTION	INSERTION, SYSTEM	-
	pp	47	1	00-7F	VARATION PART	Part1...4 (0...3)	-
						AD1, AD2 (64, 65)	
						OFF (127)	
	TOTAL SIZE		28				
40	pp	70	1	00 - 04	EQ TYPE	flat, jazz, pops, rock, concert	depends on performance number
	pp	71	1	34 - 4C	EQ GAIN1	-12...0...+12 [dB]	-
	pp	72	1	34 - 4C	EQ GAIN2	-12...0...+12 [dB]	-
	pp	73	1	34 - 4C	EQ GAIN3	-12...0...+12 [dB]	-
	pp	74	1	34 - 4C	EQ GAIN4	-12...0...+12 [dB]	-
	pp	75	1	34 - 4C	EQ GAIN5	-12...0...+12 [dB]	-
	TOTAL SIZE		06				
50	pp	00	2	00-7F	INSERTION EFFECT 1 TYPE MSB	refer to Effect Program List	depends on performance number
	pp	01		00-7F	INSERTION EFFECT 1 TYPE LSB	-	-
	pp	02	2	00-7F	INSERTION EFFECT 1 PARAMETER1 MSB	-	-
	pp	03		00-7F	INSERTION EFFECT 1 PARAMETER1 LSB	-	-
	pp	04	2	00-7F	INSERTION EFFECT 1 PARAMETER2 MSB	-	-
	pp	05		00-7F	INSERTION EFFECT 1 PARAMETER2 LSB	-	-
	pp	06	2	00-7F	INSERTION EFFECT 1 PARAMETER3 MSB	-	-
	pp	07		00-7F	INSERTION EFFECT 1 PARAMETER3 LSB	-	-
	pp	08	2	00-7F	INSERTION EFFECT 1 PARAMETER4 MSB	-	-
	pp	09		00-7F	INSERTION EFFECT 1 PARAMETER4 LSB	-	-
	pp	0A	2	00-7F	INSERTION EFFECT 1 PARAMETER5 MSB	-	-
	pp	0B		00-7F	INSERTION EFFECT 1 PARAMETER5 LSB	-	-
	pp	0C	2	00-7F	INSERTION EFFECT 1 PARAMETER10 MSB	-	-
	pp	0D		00-7F	INSERTION EFFECT 1 PARAMETER10 LSB	-	-
	pp	0E	1	00-7F	INSERTION EFFECT 1 PART	Part1...4 (0...3)	-
						AD1, AD2 (64, 65)	
						OFF (127)	
	TOTAL SIZE		0F				
51	pp	00	2	00-7F	INSERTION EFFECT 2 TYPE MSB	refer to Effect Program List	depends on performance number
	pp	01		00-7F	INSERTION EFFECT 2 TYPE LSB	-	-
	pp	02	2	00-7F	INSERTION EFFECT 2 PARAMETER1 MSB	-	-
	pp	03		00-7F	INSERTION EFFECT 2 PARAMETER1 LSB	-	-
	pp	04	2	00-7F	INSERTION EFFECT 2 PARAMETER2 MSB	-	-
	pp	05		00-7F	INSERTION EFFECT 2 PARAMETER2 LSB	-	-
	pp	06	2	00-7F	INSERTION EFFECT 2 PARAMETER3 MSB	-	-
	pp	07		00-7F	INSERTION EFFECT 2 PARAMETER3 LSB	-	-
	pp	08	2	00-7F	INSERTION EFFECT 2 PARAMETER4 MSB	-	-
	pp	09		00-7F	INSERTION EFFECT 2 PARAMETER4 LSB	-	-

pp	0A	2	00-7F	INSERTION EFFECT 2 PARAMETERS5 MSB	-	-	
pp	0B		00-7F	INSERTION EFFECT 2 PARAMETERS5 LSB	-	-	
pp	0C	2	00-7F	INSERTION EFFECT 2 PARAMETER10 MSB	-	-	
pp	0D		00-7F	INSERTION EFFECT 2 PARAMETER10 LSB	-	-	
pp	0E	1	00-7F	INSERTION EFFECT 2 PART	Part1...4 (0...3) AD1, AD2 (64, 65) OFF (127)	-	
TOTAL SIZE		0F					
60	pp	00	64	00-7F	PLUGIN BOARD 1 PARAMETER	depends on Plugin Board	depends on performance number
TOTAL SIZE		64					
61	pp	00	64	00-7F	PLUGIN BOARD 2 PARAMETER	depends on Plugin Board	depends on performance number
TOTAL SIZE		64					
pp: performance number				(00-63)			

< Table 4 - 1 >

VL System Parameter

Address (H)	Size (H)	Data (H)	Parameter	Description	Default value (H)
00 00 00	B		NOT USED		--
	0B 1	00-01	BREATH CONTROL NUMBER	BC,EXPRESSION	00
	0C 1	30-50	BREATH CONTROL CURVE	-16 - 16	40
	0D 1	00-01	WX LIP LOCK	OFF/ON	00
	0E 1	00-01	BREATH SET LOCK	OFF/ON	00
	0F 1	00-01	WX LIP	NORMAL,EXPAND	00
	10 1	00-02	BREATH MODE	BC/WX,VELOCITY,TOUCH EG	00
	11 1	00-7F	VELOCITY DEPTH	0 - 127	30
	12 1	00-7F	VELOCITY OFFSET	0 - 127	50
	13 1	00-7F	TOUCH EG TIME	0 - 127	2A
	14 1	00-7F	AT LOW DEPTH	0 - 127	1B
	15 1	00-7F	AT LOW OFFSET	0 - 127	50
	16 1	00-7F	AT HIGH DEPTH	0 - 127	25
	17 1	00-7F	AT HIGH OFFSET	0 - 127	65
TOTAL SIZE		18			

Only addresses 00000B–000017 are supported for parameter changes.

< Table 4 - 2 >

VL Current Voice/Comon Misc Parameter

Address (H)	Size (H)	Data (H)	Parameter	Description
10	00	00	1	20 - 7F
	01	1	20 - 7F	VOICE NAME #1 32 - 127 (ASCII)
	02	1	20 - 7F	VOICE NAME #2 32 - 127 (ASCII)
	03	1	20 - 7F	VOICE NAME #3 32 - 127 (ASCII)
	04	1	20 - 7F	VOICE NAME #4 32 - 127 (ASCII)
	05	1	20 - 7F	VOICE NAME #5 32 - 127 (ASCII)
	06	1	20 - 7F	VOICE NAME #6 32 - 127 (ASCII)
	07	1	20 - 7F	VOICE NAME #7 32 - 127 (ASCII)
	08	1	20 - 7F	VOICE NAME #8 32 - 127 (ASCII)
	09	1	NOT USED	
	0A	1	00 - 7F	VOICE LEVEL 0 - 127
	0B	2	00 - 02	ASSIGN MODE BOTTOM, TOP, LAST
	0C	1	00 00 - 1F 1F	POLY EXPAND off - 32 > 32
	0D	1	00 - 01	PORTAMENTO MODE FULL TIME, FINGERED
	0E	1	NOT USED	
TOTAL SIZE		0F		

< Table 4 - 3 >

VL Part Parameter					
Address	Size	Data	Parameter	Description	Default value
(H)	(H)	(H)			(H)
09 00	17	1	00 - 7F	AMP LEVEL SCALE BREAK POINT	C-2 - G8
	18	1	00 - 7F	DEPTH	-64 - +63
	19	1	00 - 7F	FILTER CUTOFF SCALE BREAK POINT	C-2 - G8
	1A	1	00 - 7F	DEPTH	-64 - +63
	1B	1		NOT USED	
	1C	1		NOT USED	
TOTAL SIZE		06			

< Table 4 - 4 >

VL Current Voice/Element Parameter					
Address	Size	Data	Parameter	Description	
(H)	(H)	(H)			
20 00	00	1		NOT USED	
	01	1		NOT USED	
	02	1		NOT USED	
	03	1		NOT USED	
	04	1		NOT USED	
	05	1		NOT USED	
	06	1		NOT USED	
	07	1		NOT USED	
	08	1		NOT USED	
	09	1		NOT USED	
	0A	1	00 - 01	EXPRESSION MODE	BC, VOLUME
	0B	1	00 - 62	PRESSURE CONTROL NO.	off - 95, AT, VELOCITY, PB
	0C	2	01 01 - 00 7F	DEPTH	-127 - +127
	0E	1	70 - 10	CURVE	-16 - +16
	0F	1	00 - 62	FILTER CONTROL NO.	off - 95, AT, VELOCITY, PB
	10	2	01 01 - 00 7F	DEPTH	-127 - +127
	12	1	70 - 10	CURVE	-16 - +16
	13	1	00 - 62	AMPLITUDE CONTROL NO.	off - 95, AT, VELOCITY, PB
	14	2	01 01 - 00 7F	DEPTH	-127 - +127
	16	1	70 - 10	CURVE	-16 - +16
	17	1	00 - 62	EMBOUCHURE CONTROL NO.	off - 95, AT, VELOCITY, PB
	18	2	01 01 - 00 7F	UPPER DEPTH	-127 - +127
	1A	2	01 01 - 00 7F	LOWER DEPTH	-127 - +127
	1C	1	00 - 01	MODE	CENTER BASE, MINIMUM BASE
	1D	1	00 - 62	TONGUING CONTROL NO.	off - 95, AT, VELOCITY, PB
	1E	2	01 01 - 00 7F	DEPTH	-127 - +127
	20	1	70 - 10	CURVE	-16 - +16
	21	1	00 - 62	SCREAM CONTROL NO.	off - 95, AT, VELOCITY, PB
	22	2	01 01 - 00 7F	DEPTH	-127 - +127
	24	1	70 - 10	CURVE	-16 - +16
	25	1	00 - 62	BREATH NOISE CONTROL NO.	off - 95, AT, VELOCITY, PB
	26	2	01 01 - 00 7F	DEPTH	-127 - +127
	28	1	70 - 10	CURVE	-16 - +16
	29	1	00 - 62	GROWL CONTROL NO.	off - 95, AT, VELOCITY, PB
	2A	2	01 01 - 00 7F	DEPTH	-127 - +127
	2C	1	70 - 10	CURVE	-16 - +16
	2D	1	00 - 62	THROAT FORMANT CONTROL NO.	off - 95, AT, VELOCITY, PB
	2E	2	01 01 - 00 7F	DEPTH	-127 - +127
	30	1	70 - 10	CURVE	-16 - +16
	31	1	00 - 62	HARMONIC ENHANCER CONTROL NO.	off - 95, AT, VELOCITY, PB
	32	2	01 01 - 00 7F	DEPTH	-127 - +127
	34	1	70 - 10	CURVE	-16 - +16
	35	1	00 - 62	DAMPING CONTROL NO.	off - 95, AT, VELOCITY, PB
	36	2	01 01 - 00 7F	DEPTH	-127 - +127
	38	1	70 - 10	CURVE	-16 - +16
	39	1	00 - 62	ABSORPTION CONTROL NO.	off - 95, AT, VELOCITY, PB

00	3A	2	01 01 - 00 7F	DEPTH	-127 - +127
00	3C	1	70 - 10	CURVE	-16 - +16
00	3D				
:	:			reserve	
0A	6A				
TOTAL SIZE		56B			

< Table 4 - 5 >

VL Custom Voice Parameter

Address (H)	Size (H)	Data (H)	Parameter	Description		
30	00	0n	1	20 - 7F	VOICE NAME #1	32-127(ASCII)
			1	20 - 7F	VOICE NAME #2	32-127(ASCII)
			1	20 - 7F	VOICE NAME #3	32-127(ASCII)
			1	20 - 7F	VOICE NAME #4	32-127(ASCII)
			1	20 - 7F	VOICE NAME #5	32-127(ASCII)
			1	20 - 7F	VOICE NAME #6	32-127(ASCII)
			1	20 - 7F	VOICE NAME #7	32-127(ASCII)
			1	20 - 7F	VOICE NAME #8	32-127(ASCII)
			1		NOT USED	
			1	00-7F	VOICE LEVEL	0 - 127
			1	00-02	ASSIGN MODE	BOTTOM,TOP,LAST
			2		NOT USED	
			1	00-01	PORTAMENTO MODE	FULLTIME,FINGERED
			B5		NOT USED	
TOTAL SIZE		A3				
31	00	0n	1		NOT USED	
			1		NOT USED	
			1		NOT USED	
			1		NOT USED	
			1		NOT USED	
			1		NOT USED	
			1		NOT USED	
			1		NOT USED	
			1		NOT USED	
			1		NOT USED	
			1	00-01	EXPRESSION MODE	BC,VOLUME
			1	00-62	PRESSURE CONTROL NO.	off - 95,AT,VELOCITY,PB
			2	01 01-00 7F	DEPTH	-127 - +127
			1	70-10	CURVE	-16 - +16
			1	00-62	FILTER CONTROL NO.	off - 95,AT,VELOCITY,PB
			2	01 01-00 7F	DEPTH	-127 - +127
			1	70-10	CURVE	-16 - +16
			1	00-62	AMPLITUDE CONTROL NO.	off - 95,AT,VELOCITY,PB
			2	01 01-00 7F	DEPTH	-127 - +127
			1	70-10	CURVE	-16 - +16
			1	00-62	EMBOUCHURE CONTROL NO.	off - 95,AT,VELOCITY,PB
			2	01 01-00 7F	UPPER DEPTH	-127 - +127
			2	01 01-00 7F	LOWER DEPTH	-127 - +127
			1	00-01	MODE	CENTER BASE,MINIMUM BASE
			1	00-62	TONGUING CONTROL NO.	off - 95,AT,VELOCITY,PB
			2	01 01-00 7F	DEPTH	-127 - +127
			1	70-10	CURVE	-16 - +16
			1	00-62	SCREAM CONTROL NO.	off - 95,AT,VELOCITY,PB
			2	01 01-00 7F	DEPTH	-127 - +127
			1	70-10	CURVE	-16 - +16
			1	00-62	BREATH NOISE CONTROL NO.	off - 95,AT,VELOCITY,PB
			2	01 01-00 7F	DEPTH	-127 - +127
			1	70-10	CURVE	-16 - +16
			1	00-62	GROWL CONTROL NO.	off - 95,AT,VELOCITY,PB
			2	01 01-00 7F	DEPTH	-127 - +127
			1	70-10	CURVE	-16 - +16

1	00-62	THROAT FORMANT CONTROL NO.	off - 95,AT,VELOCITY,PB
2	01 01-00 7F	DEPTH	-127 - +127
1	70-10	CURVE	-16 - +16
1	00-62	HARMONIC ENHANCER CONTROL NO.	off - 95,AT,VELOCITY,PB
2	01 01-00 7F	DEPTH	-127 - +127
1	70-10	CURVE	-16 - +16
1	00-62	DAMPING CONTROL NO.	off - 95,AT,VELOCITY,PB
2	01 01-00 7F	DEPTH	-127 - +127
1	70-10	CURVE	-16 - +16
1	00-62	ABSORPTION CONTROL NO.	off - 95,AT,VELOCITY,PB
2	01 01-00 7F	DEPTH	-127 - +127
1	70-10	CURVE	-16 - +16
52E		reserve	
TOTAL SIZE	56B		
n = Voice Number(0 - 5)			

< Table 4 - 6 >

VL Internal Voice Parameter

Address (H)	Size (H)	Data (H)	Parameter	Description
40 00 nn	1	20 - 7F	VOICE NAME #1	32 - 127 (ASCII)
	1	20 - 7F	VOICE NAME #2	32 - 127 (ASCII)
	1	20 - 7F	VOICE NAME #3	32 - 127 (ASCII)
	1	20 - 7F	VOICE NAME #4	32 - 127 (ASCII)
	1	20 - 7F	VOICE NAME #5	32 - 127 (ASCII)
	1	20 - 7F	VOICE NAME #6	32 - 127 (ASCII)
	1	20 - 7F	VOICE NAME #7	32 - 127 (ASCII)
	1	20 - 7F	VOICE NAME #8	32 - 127 (ASCII)
	1	00 - 7F	VOICE LEVEL	0 - 127
	1	00 - 02	ASSIGN MODE	BOTTOM, TOP, LAST
2D			NOT USED	
	1	00 - 7F	AMP LEVEL SCALE BREAK POINT	C-2 - G8
	1	00 - 7F	DEPTH	-64 - +63
	1	00 - 7F	FILTER CUTOFF SCALE BREAK POINT	C-2 - G8
	1	00 - 7F	DEPTH	-64 - +64
	1	00 - 02	BANK POINTER	PRESET1, PRESET2, CUSTOM
	1	00 - 7F	PROGRAM POINTER	1 - 128
33			NOT USED	
	1	00 - 01	EXPRESSION MODE	BC, VOLUME
	1	00 - 62	PRESSURE CONTROL NO.	off - 95, AT, VELOCITY, PB
	2	01 01 - 00 7F	DEPTH	-127 - +127
	1	70 - 10	CURVE	-16 - +16
	1	00 - 62	FILTER CONTROL NO.	off - 95, AT, VELOCITY, PB
	2	01 01 - 00 7F	DEPTH	-127 - +127
	1	70 - 10	CURVE	-16 - +16
	1	00 - 62	AMPLITUDE CONTROL NO.	off - 95, AT, VELOCITY, PB
	2	01 01 - 00 7F	DEPTH	-127 - +127
	1	70 - 10	CURVE	-16 - +16
	1	00 - 62	ENBOUCHURE CONTROL NO.	off - 95, AT, VELOCITY, PB
	2	01 01 - 00 7F	UPPER DEPTH	-127 - +127
	2	01 01 - 00 7F	LOWER DEPTH	-127 - +127
	1	00 - 01	MODE	CENTER BASE, MINIMUM BASE
	1	00 - 62	TONGUING CONTROL NO.	off - 95, AT, VELOCITY, PB
	2	01 01 - 00 7F	DEPTH	-127 - +127
	1	70 - 10	CURVE	-16 - +16
	1	00 - 62	SCREAM CONTROL NO.	off - 95, AT, VELOCITY, PB
	2	01 01 - 00 7F	DEPTH	-127 - +127
	1	70 - 10	CURVE	-16 - +16
	1	00 - 62	BREATH NOISE CONTROL NO.	off - 95, AT, VELOCITY, PB
	2	01 01 - 00 7F	DEPTH	-127 - +127
	1	70 - 10	CURVE	-16 - +16
	1	00 - 62	GROWL CONTROL NO.	off - 95, AT, VELOCITY, PB

2	01 01 - 00 7F	DEPTH	-127 - +127
1	70 - 10	CURVE	-16 - +16
1	00 - 62	THROAT FORMANT CONTROL NO.	off - 95, AT, VELOCITY, PB
2	01 01 - 00 7F	DEPTH	-127 - +127
1	70 - 10	CURVE	-16 - +16
1	00 - 62	HARMONIC ENHANCER CONTROL NO.	off - 95, AT, VELOCITY, PB
2	01 01 - 00 7F	DEPTH	-127 - +127
1	70 - 10	CURVE	-16 - +16
1	00 - 62	DAMPING CONTROL NO.	off - 95, AT, VELOCITY, PB
2	01 01 - 00 7F	DEPTH	-127 - +127
1	70 - 10	CURVE	-16 - +16
1	00 - 62	ABSORPTION CONTROL NO.	off - 95, AT, VELOCITY, PB
2	01 01 - 00 7F	DEPTH	-127 - +127
1	70 - 10	CURVE	-16 - +16

TOTAL SIZE    A3  
nn = Voice Number (00 - 3F)

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default	x	1 - 16	
	Changed	x	1 - 16	
Mode	Default	x	3	
	Messages	x	3, 4 (m=1) *2	
	Altered	*****	x	
Note Number :	True voice	x	0 - 127	
		*****	0 - 127	
Velocity	Note ON	x	o 9nH,v=1-127	
	Note OFF	x	x	
After Touch	Key's	x	o *1	
	Ch's	x	o *1	
Pitch Bend		x	o 0-24 semi *1	
Control Change	0,32	x	o *1	Bank Select
	1,2,4,5,7	x	o *1	
	10,11,13	x	o *1	
	6,38	x	o *1	Data Entry
	64-67	x	o *1	
	71-74	x	o *1	Sound Controller
	84	x	o *1	Portamento Cntrl
	91,93,94	x	o *1	Effect Depth
	96-97	x	o *1	RPN Inc,Dec
	98-99	x	o *1	NRPN LSB,MSB
	100-101	x	o *1	RPN LSB,MSB
	120	x	o	All Sound Off
	121	x	o	Reset All Cntrls
	Prog Change :	True #	x	o 0 - 127
*****				
System Exclusive		o *3	o *3	
Common :	Song Pos.	x	x	
	Song Sel.	x	x	
	Tune	x	x	
System Real Time:	Clock	x	x	
	Commands	x	x	
Aux : : All Notes OFF Mes- : Active Sense sages : Reset		x	x	
		x	o(123-127)	
		x	o	
		x	x	
Notes: *1 receive if switch is on. *2 m is always treated as "1" regardless of its value. *3 transmit/receive if exclusive switch is on.				

Mode 1 : OMNI ON , POLY  
Mode 3 : OMNI OFF, POLY

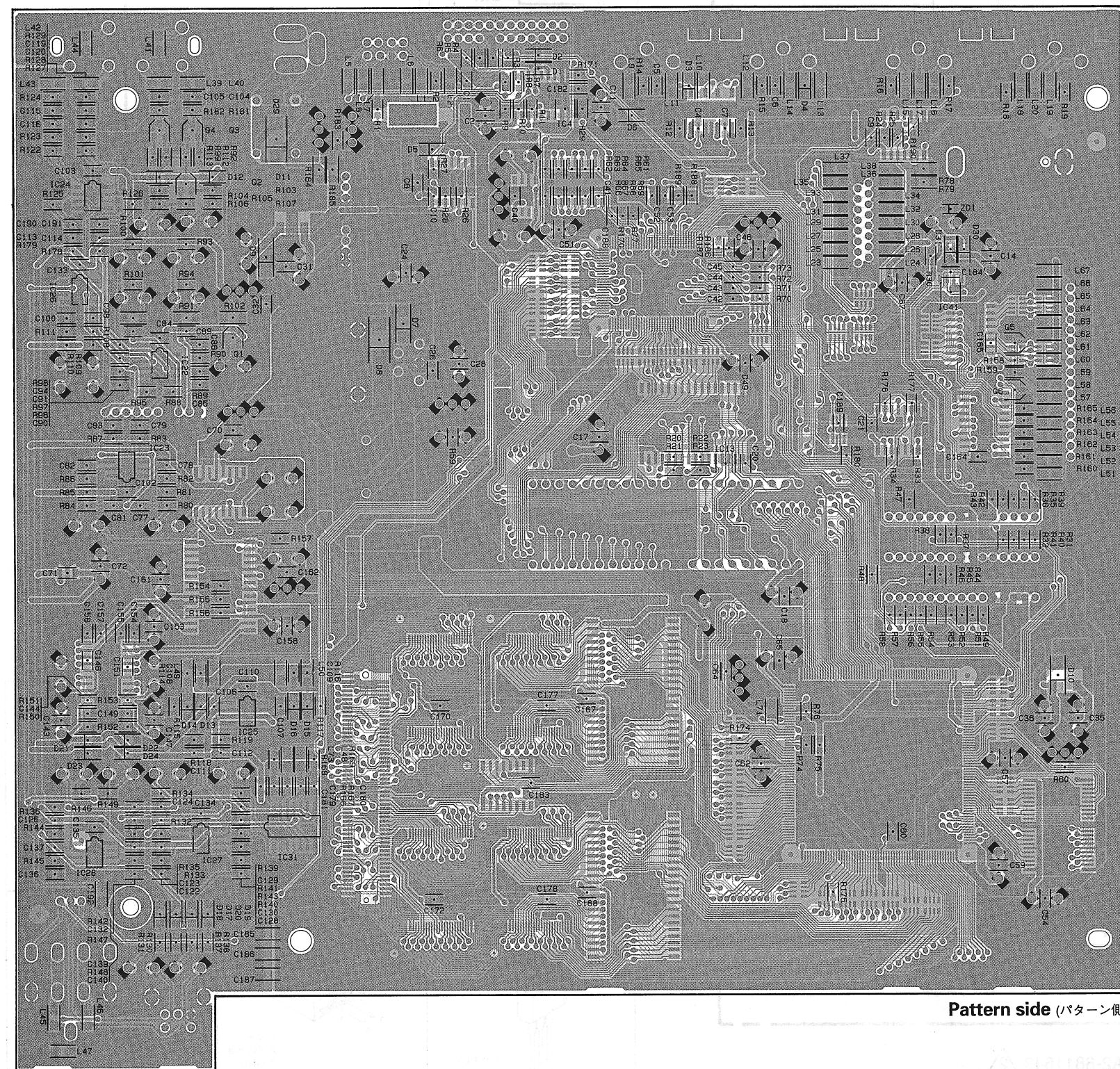
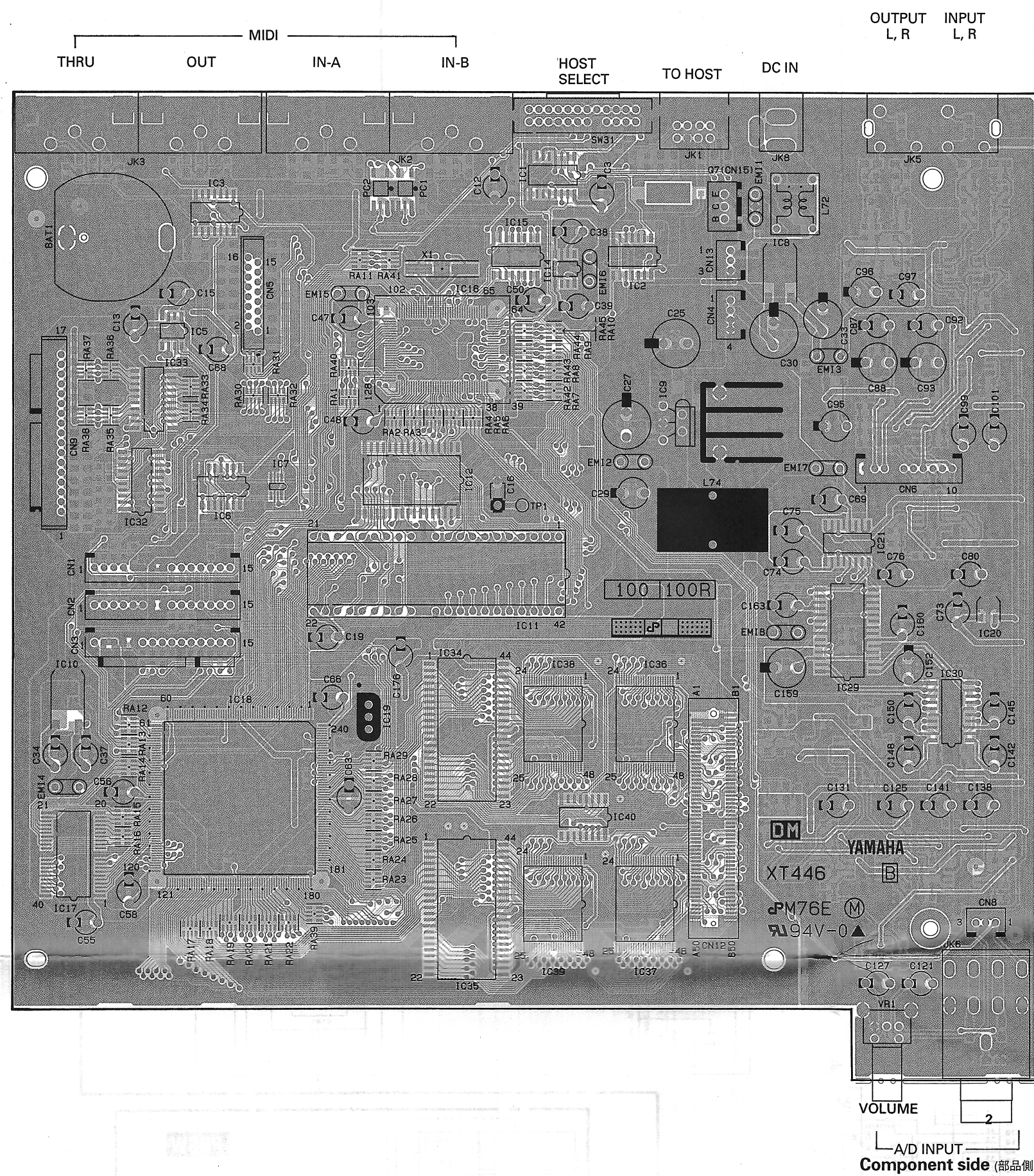
Mode 2 : OMNI ON ,MONO  
Mode 4 : OMNI OFF,MONO

o : Yes  
x : No

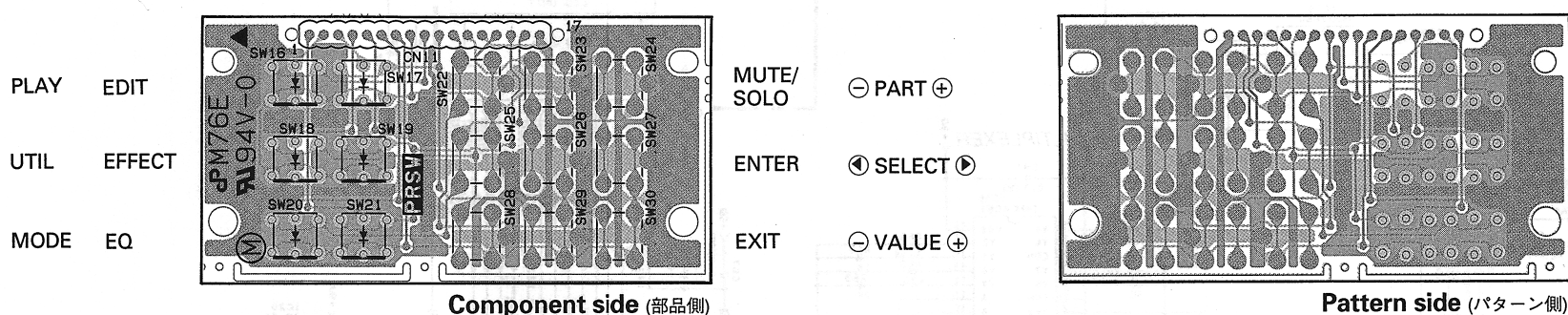


# CIRCUIT BOARDS (シート基板図)

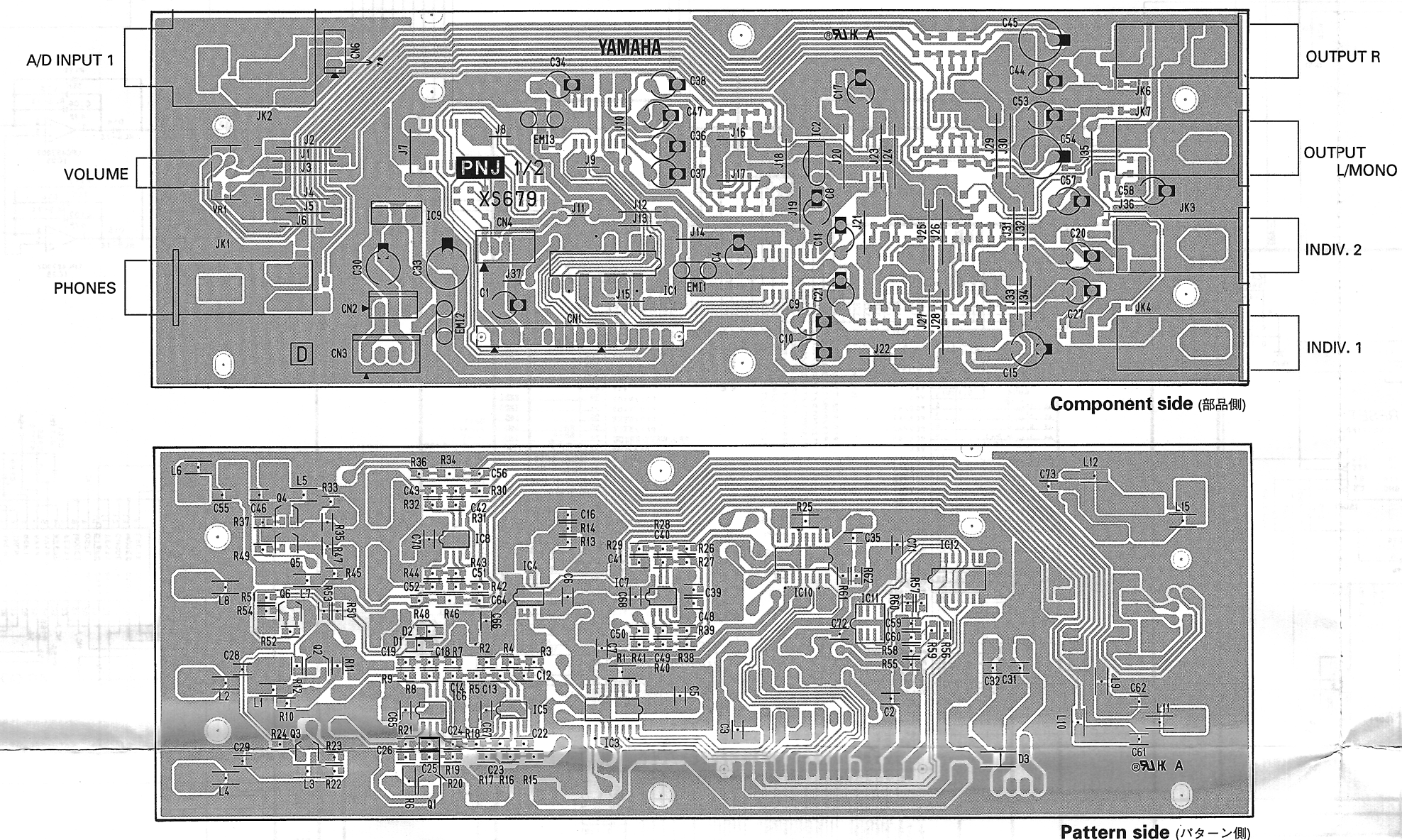
## DM Circuit Board



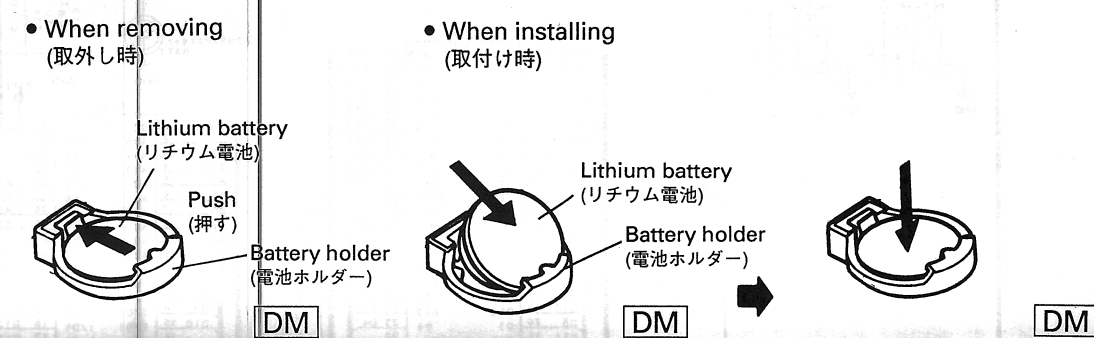
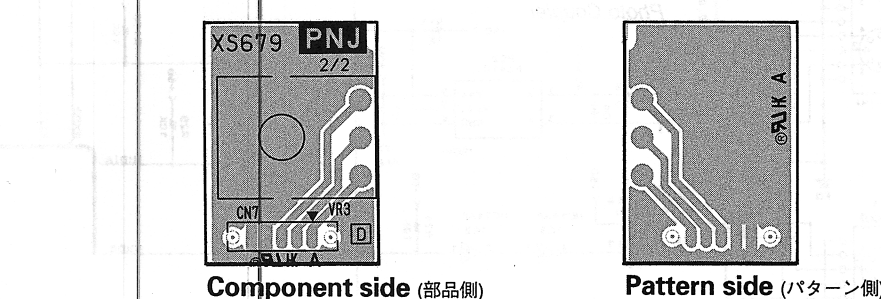
## PRSW Circuit Board



## PNJ Circuit Board



## RE Circuit Board



※ The lithium battery is not a part of the DM circuit board.  
(リチウム電池はDMシートの構成部品ではありません)

### Notes

#### Circuit Board:

DM (VZ019200) XT446C0

PRSW (VZ019100) XT446C0

01. IC

IC1: MC34051MEL (XP681A00)

IC2,3: TC74HC14AF-TP1 (XD657A00)

IC4: SC75U04FEL (X0348A00)

IC5: INVERTER M50201FP (X0886A00) RESET

IC6: TC74HC126AF (X5776A00) BUS BUFFER

IC7: TC7W14FU (X0883A00) INVERTER

IC8: UP2C909T (XT441A00) INVERTER

IC9: REGULATOR +5V SI-8050S (XT442A00)

IC10: REGULATOR +5V UPC2933T (XS516A00)

IC11: REGULATOR +3.3V M5M51008BFP-70LL (XS681A00)

IC12: TC74HC126AF (X5776A00) BUS BUFFER

IC13: TC75U04FEL (X0348A00)

IC14: INVERTER M50201FP (X0886A00) RESET

IC15: HD6432653 (16M) (XT443A00) CPU

IC16: M5M4426DCTP-7 (XS438A00)

IC17: 70N5 AM TC203C760HF-001 (XF738A00) or TC203C760HF-002 (XS725A00)

IC18: SWP90 NJM78L05UA (XJ598A00)

IC19: REGULATOR +5V UPC4570G2 (XF291A00) OP AMP

IC20: TL082C (XS892A00)

IC21: AD CONVERTER TL082C (XS892A00)

IC22: AD FRONT END TC74HC406AF-T1 (XG385A00)

IC23: ANALOG SWITCH SN74HC273NSR (XH223A00) D-FF

IC24: TC74HC245F-T1 (XD603A00)

IC25: TRANSCIEVER KM2C3200AG-4J (XS518A00)

IC26: MA ROM KM23C3200AG-5J (XS743A00)

IC27: MA ROM KM23C3200AG-5J (XS743A00)

IC28: 23C16000WGY828 (XT445A00)

IC29: ROM1 23C16000WGY829 (XT461A00)

IC30: ROM2 MX23C3210TC-10 (X462A00)

IC31: ROM3 HD74LV139FP (XS048A00) DEC

IC32: TC7566F (XR682A00) ANALOG SWITCH

IC33: 312V100 (XT714E00) EPROM

IC34: 2SCDT143XK (VD456900)

IC35: MA221 (VB439900)

IC36: D1F50 (VZ01100)

IC37: D3FP3 (VZ016600)

IC38: MA221 (VB439900)

IC39: UDZ 3.87E-17 3. (VU171600)

IC40: PC410T (VN686000)

IC41: PC410T (VN686000)

IC42: PC410T (VN686000)

IC43: PC410T (VN686000)

IC44: PC410T (VN686000)

IC45: PC410T (VN686000)

IC46: PC410T (VN686000)

IC47: PC410T (VN686000)

IC48: PC410T (VN686000)

IC49: PC410T (VN686000)

### Notes

#### Circuit Board:

DM (VZ019200) XT446C0

PRSW (VZ019100) XT446C0

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IC37: D3FP3 (VZ016600)

IC38: MA221 (VB439900)

IC39: UDZ 3.87E-17 3. (VU171600)

IC40: PC410T (VN686000)

IC41: PC410T (VN686000)

IC42: PC410T (VN686000)

IC43: PC410T (VN686000)

IC44: PC410T (VN686000)

IC45: PC410T (VN686000)

IC46: PC410T (VN686000)

IC47: PC410T (VN686000)

IC48: PC410T (VN686000)

IC49: PC410T (VN686000)

### Notes

#### Circuit Board:

DM (VZ019200) XT446C0

PRSW (VZ019100) XT446C0

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IC11: REGULATOR +3.3V M5M51008BFP-70LL (XS681A00)

IC12: TC74HC126AF (X5776A00) BUS BUFFER

IC13: TC75U04FEL (X0348A00)

IC14: INVERTER M50201FP (X0886A00) RESET

IC15: HD6432653 (16M) (XT443A00) CPU

IC16: M5M4426DCTP-7 (XS438A00)

IC17: 70N5 AM TC203C760HF-001 (XF738A00) or TC203C760HF-002 (XS725A00)

IC18: SWP90 NJM78L05UA (XJ598A00)

IC19: REGULATOR +5V UPC4570G2 (XF291A00) OP AMP

IC20: TL082C (XS892A00)

IC21: AD CONVERTER TL082C (XS892A00)

IC22: AD FRONT END TC74HC406AF-T1 (XG385A00)

IC23: ANALOG SWITCH SN74HC273NSR (XH223A00) D-FF

IC24: TC74HC245F-T1 (XD603A00)

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IC44: PC410T (VN686000)

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IC46: PC410T (VN686000)

IC47: PC410T (VN686000)

IC48: PC410T (VN686000)

IC49: PC410T (VN686000)

### Notes

#### Circuit Board:

DM (VZ019200) XT446C0

PRSW (VZ019100) XT446C0

01. IC

IC1: MC34051MEL (XP681A00)

IC2,3: TC74HC14AF-TP1 (XD657A00)

IC4: SC75U04FEL (X0348A00)

IC5: INVERTER M50201FP (X0886A00) RESET

IC6: TC74HC126AF (X5776A00) BUS BUFFER

IC7: TC7W14FU (X0883A00) INVERTER

IC8: UP2C909T (XT441A00) INVERTER

IC9: REGULATOR +5V SI-8050S (XT442A00)

IC10: REGULATOR +5V UPC2933T (XS516A00)

IC11: REGULATOR +3.3V M5M51008BFP-70LL (XS681A00)

IC12: TC74HC126AF (X5776A00) BUS BUFFER

IC13: TC75U04FEL (X0348A00)

IC14: INVERTER M50201FP (X0886A00) RESET

IC15: HD6432653 (16M) (XT443A00) CPU

IC16: M5M4426DCTP-7 (XS438A00)

IC17: 70N5 AM TC203C760HF-001 (XF738A00) or TC203C760HF-002 (XS725A00)

IC18: SWP90 NJM78L05UA (XJ598A00)

IC19: REGULATOR +5V UPC4570G2 (XF291A00) OP AMP

IC20: TL082C (XS892A00)

IC21: AD CONVERTER TL082C (XS892A00)

IC22: AD FRONT END TC74HC406AF-T1 (XG385A00)

IC23: ANALOG SWITCH SN74HC273NSR (XH223A00) D-FF

IC24: TC74HC245F-T1 (XD603A00)

IC25: TRANSCIEVER KM2C3200AG-4J (XS518A00)

IC26: MA ROM KM23C3200AG-5J (XS743A00)

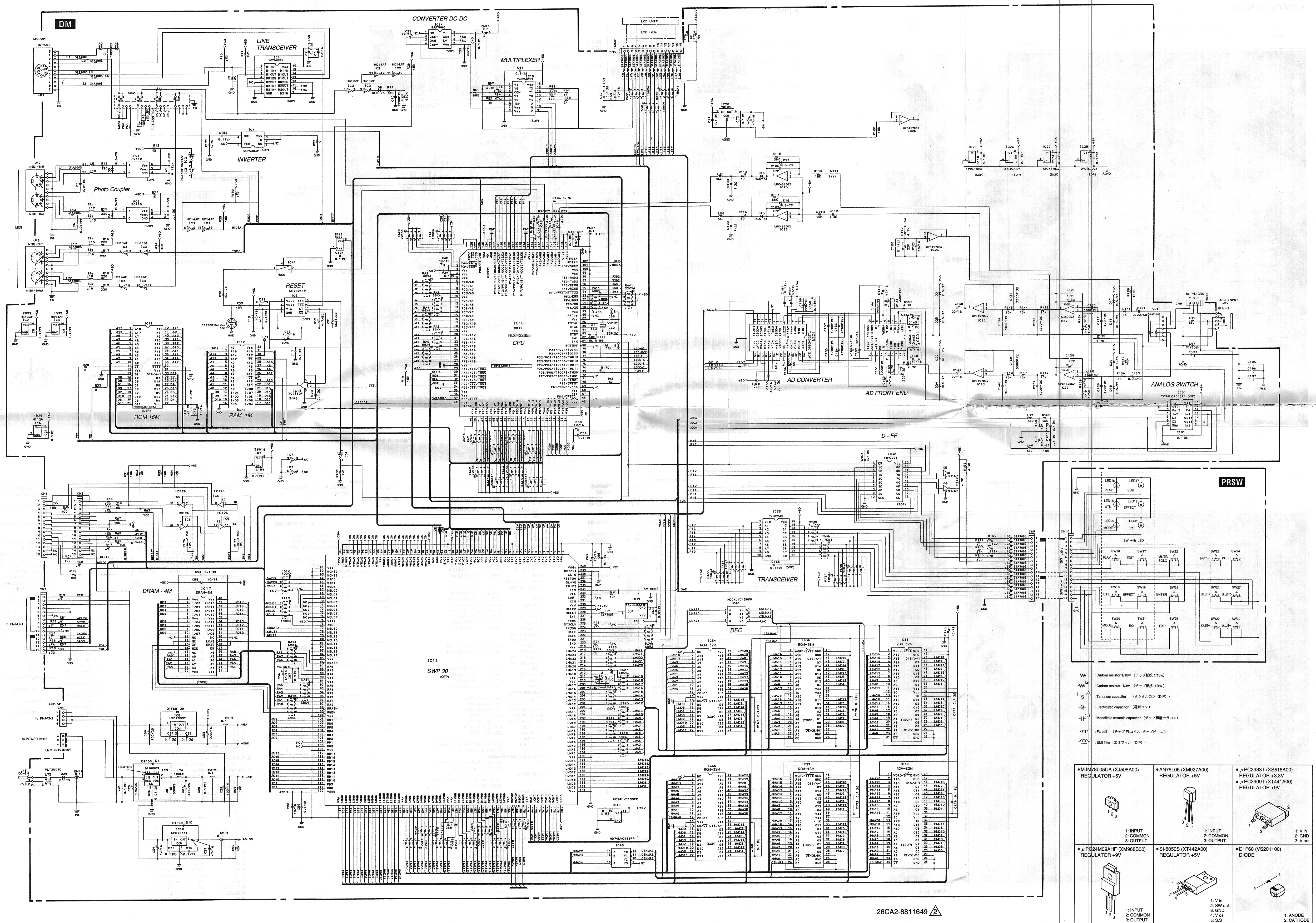
IC27: MA ROM KM23C3200AG-5J (XS743A00)

IC28: 23C16000WGY828 (XT445A00)

IC29: ROM1 23C16000WGY829 (XT461A00)

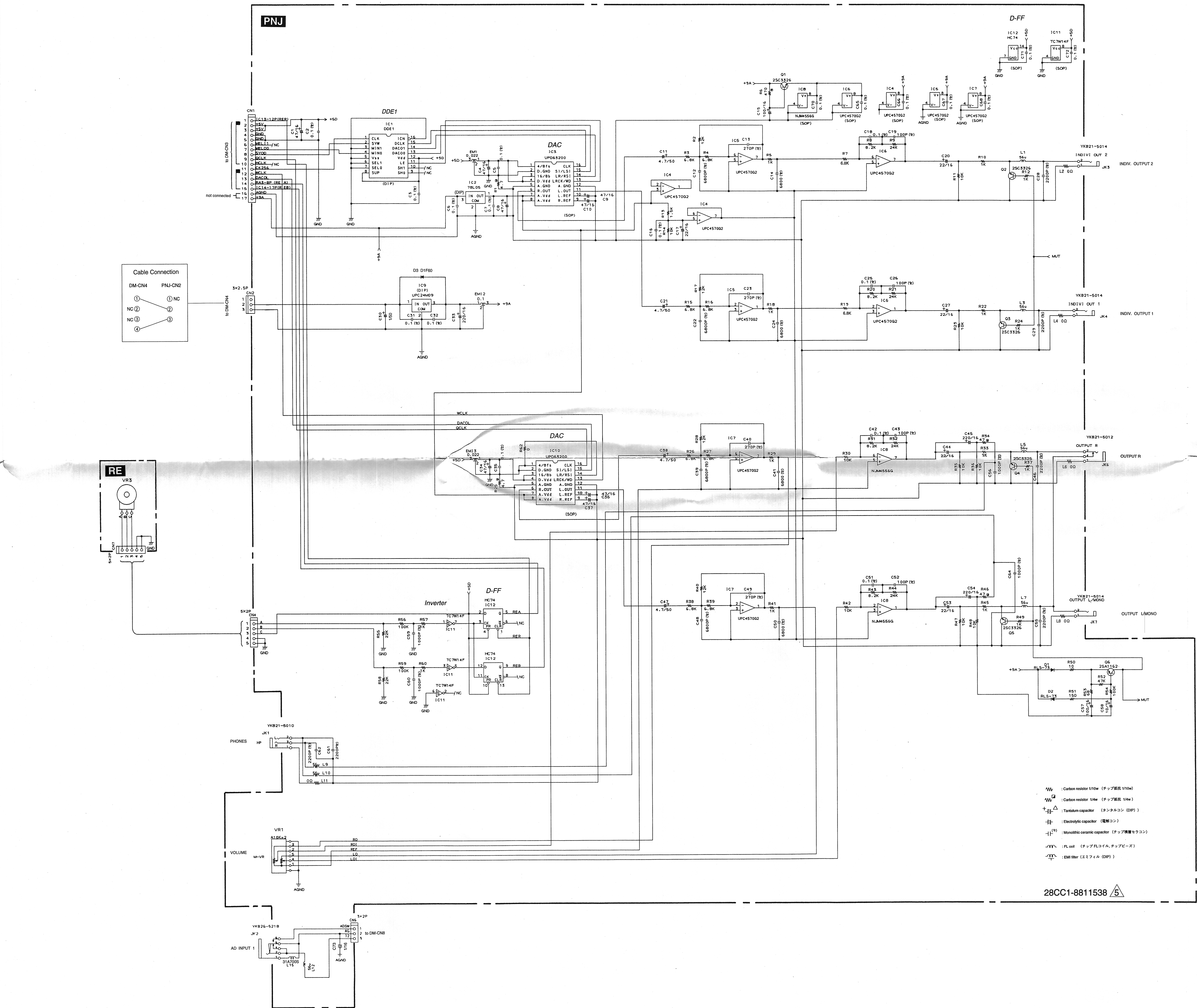
IC30: ROM2 MX23C3210TC-10 (X462A00)







MU100R OVERALL CIRCUIT DIAGRAM 2/2 (PNJ, RE)



Circuit Board:	DM (V2019200) XT446C0 PRSW (V2019100) XT446C0	15. LC Filter EMI 1-6.8 L72 172	STP-1042B-TBM (VR193800) FLT203C (V5023600)
01. IC:	MC34051MEL (DP81A00)	17. Rotary Variable Resistor VR 1:	RK09K12A06CA (V5696800) AD INPUT C VOLUME
IC2:	TC74HC14AF-1P1 (XD657A00)		
IC4:	SC73B04FEL (D348A00)	18. Slide Switch SW 31:	SS3F14-028N-0 (V0655200) HOST SELECT
IC6:	M2021FP (X086A00) RESET	19. Push Switch SW16-21:	SK0HPN GREEN (XK701100) SW16PLAY SW17EDIT SW18JLT/L SW19EFFECT SW20MODE SW21EQ SW22-30: SK0HPH (VW21700) SW223-WATERLOO SW23PART- SW24PARC SW25-ENTER SW26SELECT- SW27SELECT- SW28EXT- SW29VALUE- SW30VALUE-
IC8:	TC74HC126AF (K3778A00)		
IC7:	TC7V14FU (XN883A00) INVERTER		
IC9:	LINE TRANSCEIVER		
IC10:	UPC2902T (XT41A00)		
IC11:	REGULATOR +4V		
IC12:	SI-8650S (X144A00)		
IC13:	REGULATOR +3V		
IC14:	M6M10088FP (X086A00)		
IC15:	SRAM		
IC16:	TC73S2F (X086A00) OR		
IC17:	NJL7608M-TT (FP09A00)		
IC18:	CONVERTER D-C-DC TC74HC041AF-1P2 (X095A00)	18. DC-IN Connector J 8:	16V DC-3A HE23 (V1027A00) DC IN
IC19:	TC23C780HF-01 (X078A00) or TC23C780HF-02 (X078A00)	20. Phone Jack J 6:	YK26E-52 (VT160000) AD INPUT 2
IC20:	SWP30	21. DIN Connector J 1:	DIN 6P MD-58 (VW761000) TO HOST
IC25-28:	UPC4070G (X291A00) OP AMP	J 2,3:	3P VPS-50 (X085500) JK2-MIDI IN A, MIDI IN B JK3-MIDI OUT, MIDI THRU
IC29:	TC23C4585RC (X589A00)		
IC30:	LINE SELECTOR		
IC31:	AD FRONT END	22. Base Port Connector CN 15:	XH 3P (UB1916030) TO POWER Switch
IC32:	TC74HC04AF-1P1 (X095A00)	23. Connector Base Port CN 4:	PH 4P (V8398000) Ph 3P TE (V3889900) TO PNA-CN2
IC33:	ANALOG SWITCH	CN 8:	16P TE (V5866700) TO DM-CN1
IC34:	SN74HC273NSR (X022A00) D-FF	24. Connector CN 5:	52147 1P (VF687800) TO PNA-CN1
IC35:	TRANSDUCER	CN 3:	SLW 16P TE (V5866700) TO DM-CN1
IC36:	KM23C200A-4J (X518A00)	CN 8:	52147 17P (VF677000) TO PHSW CN11
IC37:	MA ROM		
IC38:	25C1600WGY828 (XT45A00)		
IC39:	ROM1		
IC40:	25C1600WGY829 (XT45A00)		
IC41:	ROM2		
IC42:	MX23C210T-10 (XT46A00)		
IC43:	ROM3	25. Cable Holder CN 11:	51048 17P (V8778500) TO DM-CN9
IC44:	HD74LVC138F (X048A00) DEC	26. IC Socket IC11:	DI0F-42CS-E (V963100)
IC45:	TC73S2F (X086A00)	27. Battery Holder BAT 1:	CR2032 (VN103600)
IC46:	ANALOG SWITCH	28. Holder, Jack J 2:	(V448200)
IC47:	312V100 (XTT-RE50) EPROM	29. Connector Assembly CN 1,2:	15P-210 ( -- ) 50,60: 15P-210 ( -- )
2. Transistor	25CDT143X (V465900)	30. Heat Sink S1:	T220M-25L (BA055020) 20
3. Diode	UDZ 3.8BTE-1P 3, (VU171500)	31. Bend Head Screw S2:	3.0X6 MFZNBZL (EG303360)
4. Zener Diode	PC140T (V869000)		
5. Photo Coupler	16M SMD-48 (P864900)	Notes:	
6. Quartz Crystal	UDZ-49S5 (V3454500)	Circuit Board:	PNJ (V2037900) X567900 JG (V207800) X567900
7. Monolithic Ceramic Cap.	SL 100P 50V J (UB025100)	1. IC	RE710069 (PM28000) DDE1
C 2.4, 7.5, 14, 17	C 1.123.100	IC1:	AN78L02-1 (UM527A00)
18,20,21,24,28	C 1.123.100	IC2:	REGULATOR +5V
F 0.025, 36, 40, 42	F 0.100 25V Z (UB04100)	IC3:	UD2902GDS (XM14A00)
C 5.6, 26, 42, 45	F 2200P 50V K (UB013220)	IC4:	DA CONVERTER
C 1.123.100	F 0.100 25V Z (UB04100)	IC4-7:	UPC45702 (XP291A00) OP AMP
C 41, 48, 49, 51, 54	F 0.100 25V Z (UB04100)	IC8:	MA4586A1M1 (X0138A00) SMD
C 56.25, 48, 45	SL 33P 50V J (UB011330)	IC9:	UPC2902M4AF (X086A00)
C 67, 72, 120	SL 47P 50V J (UB051470)	IC11:	REGULATOR +3V
C 108, 107, 124	F 1.0 16V Z (VQ866200)	IC12:	TC7V14FU (XN883A00)
C 112, 105, 117		28. Transistor	
C 110, 133, 135		O 1-8:	25C3238 A TE88 (VU303700)
C 143, 147, 153		O 6:	25A1182, O 7 (V937200)
C 168, 161, 162		1. Diode D 1,2:	MA221 (V849300)
C 164	F 0.100 25V Z (UB04100)	D 3:	D1F60 (V5201100)
C 128, 132	F 470P 50V J (UB014700)	5. Monolithic Ceramic Cap.	
C 138, 140	F 1200P 50V K (UB013120)	C 1.4, 8, 10, 24, 36	
C 136, 140	SL 180P 50V J (UB026180)	41, 48, 50:	77 8900P 50V K (UB013860)
C 154, 157	F 3300P 50V K (UB015330)	C 15, 16, 28, 39:	F 270P 50V J (UB013270)
C 151	F 220P 50V J (UB015220)	C 19, 26, 43, 52:	SL 100P 50V J (UB025100)
C 154, 157	F 4700P 50V K (UB015470)	C 28, 29, 46, 55, 61	
C 165, 167, 168	F 220P 50V J (UB015220)	C 62:	F 2200P 50V K (UB013220)
C 170, 172, 177	F 4700P 50V K (UB015470)	C 66, 69, 60, 64:	F 100P 50V K (UB011010)
C 182	F 0.100 25V Z (UB04100)	C 70, 72:	F 0.100 25V Z (UB04100)
C 183, 184, 189	F 0.100 25V Z (UB04100)	C 73:	F 1.0 16V Z (VQ866200)
C 3.15, 19, 47, 48		6. Electrolytic Cap.	
C 50.55, 56, 58, 60		C 1.4, 8, 10, 24, 36	
66, 68, 101, 175	10.00 16.0V (UJ37100)	C 37:	47.00 16.0V (UJ383100)
C 19	4.70 50.0V (UJ984070)	C 41, 42, 21, 38, 47:	37 50.00 16.0V (UJ383100)
C 25, 27:	470.0 25.0V (UJ948470)	C 10, 15, 17:	10.00 16.0V (UJ383100)
C 29, 162:	100.00 16.0V (UJ383100)	C 17, 20, 27, 44, 53, 52, 32:	10.00 16.0V (UJ383100)
C 30:	100.00 25.0V (UJ948470)	C 29:	1.00 50.0V (UJ885100)
C 33, 159:	22.00 16.0V (UJ383220)	C 33, 45, 54:	22.00 16.0V (UJ383220)
C 34, 37, 73, 142		C 36:	10.00 16.0V (UJ383100)
C 140, 149		7. Chip Inductor	
C 160, 163:	47.0 16.0V (UJ374770)	L 1.5, 3.7, 8.1, 10, 12, 360	LEM250T 756 (VR43700)
C 38, 39, 138, 141	22.00 16.0V (UJ383100)	8. Solid Inductor (chip)	
C 121, 127:	0.22 50.0V (UJ962220)	L 15:	BLM1A700STP70 (VL139800)
C 123, 131:	1.00 50.0V (UJ966100)	9. Carbon Resistor (chip)	
8. Tantalum Cap.		L 2.6, 6.8, 11:	0.0 14A J (PD150000)
L 47	4.70 16V M (FP758470)	R 2, 3, 155, 158:	56.0 0.1 J (PD254560)
L 10, 12, 13, 15		L 3, 4:	10.0K 0.1 J (PD257100)
L 16, 19, 45, 46		R 2, 3, 155, 158:	10.0K 0.1 J (PD257100)
9. Solid Inductor (chip)		L 10, 11, 12, 14:	10.0K 0.1 J (PD257100)
L 1.2, 5, 6, 11, 14		R 14, 19:	220.0 0.1 J (PD255220)
L 17, 20, 25, 38, 47		R 18:	1.0K 0.1 J (PD255220)
11-F1, 77:	BLM1A700STP70 (VL139800)	R 27, 61:	680.0 0.1 J (PD255680)
10. Carbon Resistor (chip)		R 68:	680.0 0.1 J (PD255680)
L 3, 4:	0.0 14A J (PD150000)	R 37, 39, 41, 45:	
R 2, 3, 155, 158:	56.0 0.1 J (PD254560)	44, 48, 56, 58, 74:	
L 10, 11, 12, 14:	10.0K 0.1 J (PD257100)	L 10, 12, 13, 15:	100.0 0.1 J (PD255100)
R 14, 19:	220.0 0.1 J (PD255220)	R 26, 45, 47, 51:	
R 18:	1.0K 0.1 J (PD255220)	R 37, 39, 41, 45:	
R 27, 61:	680.0 0.1 J (PD255680)	R 68, 160, 165:	470.0 0.1 J (PD255470)
R 68:	680.0 0.1 J (PD255680)	R 69:	2.0K 0.1 J (PD256220)
R 37, 39, 41, 45:		R 70, 73, 101, 150:	
44, 48, 56, 58, 74:		153, 158, 159	
L 10, 12, 13, 15:	100.0 0.1 J (PD255100)	71:	4.7K 0.1 J (PD256470)
R 26, 45, 47, 51:		R 76:	47K 0.1 J (PD256470)
R 37, 39, 41, 45:		R 81, 14, 19:	68.0 14A J (PD5480)
R 68, 160, 165:	470.0 0.1 J (PD255470)	R 22, 4K 0.1 J (PD257220)	
R 69:	2.0K 0.1 J (PD256220)	R 47, 14, 19:	47.0 14A J (PD5470)
R 70, 73, 101, 150:		R 115, 117:	80.0K 0.1 J (PD256780)
153, 158, 159		R 118, 119:	15.0K 0.1 J (PD257150)
71:	4.7K 0.1 J (PD256470)	R 150, 152, 154:	
R 76:	47K 0.1 J (PD256470)	R 137, 139, 141:	
R 81, 14, 19:	68.0 14A J (PD5480)	146, 148:	
R 22, 4K 0.1 J (PD257220)		R 153, 145:	
R 47, 14, 19:	47.0 14A J (PD5470)	R 169, 176, 177:	
R 115, 117:	80.0K 0.1 J (PD256780)	R 180, 180:	
R 118, 119:	15.0K 0.1 J (PD257150)	R 191:	
R 150, 152, 154:		R 174, 175:	68.0 0.1 J (PD256480)
R 137, 139, 141:		R 186:	4.7K 0.1 J (PD256470)
146, 148:		R 192:	100.0 0.1 J (PD255100)
R 153, 145:			
R 169, 176, 177:			
R 180, 180:			
R 191:			
R 174, 175:	68.0 0.1 J (PD256480)		
R 186:	4.7K 0.1 J (PD256470)		
R 192:	100.0 0.1 J (PD255100)		
14. Resistor Array			
RA 1-11:	180 (RE045180)		
RA 2, 11, 4, 20:	68 (RE044680)		
RA 12, 13, 30, 35:	10 (RE044100)		
RA 21, 29, 39:	68 (RE044680)		
RA 33, 34, 38:	10K (RE044100)		
RA 35, 38:	4.7K (RE044070)		
RA 40-45:	22K (RE044220)		

# TONE GENERATOR

# MU100R

# PARTS LIST

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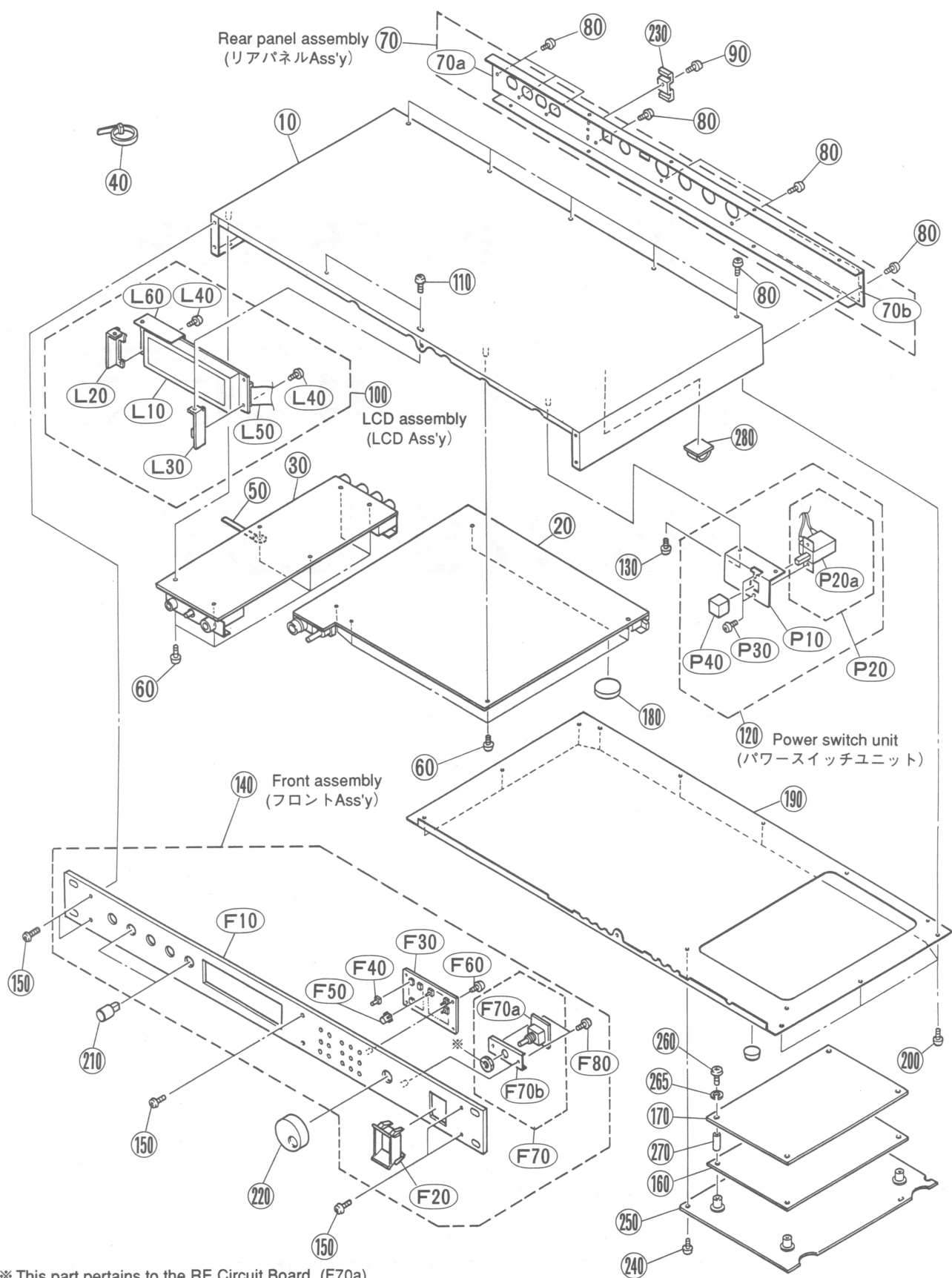
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Note) DESTINATION ABBREVIATIONS

J : Japanese model	A : Australian model
U : U.S.A. model	E : European model
C : Canadian model	D : German model
X : General model	B : British model
M : South African model	I : Indonesian model
H : North European model	O : Chinese model

- The numbers in "QTY" shows quantities for each unit.
  - The parts with "--" in "Parts No." are not available as spare parts.
- 部品価格ランクは、変更になることがあります。
  - QTY 欄に記されている数字は、各ユニット当たりの使用個数です
  - 部品 No.が "--" の部品は、サービス用部品として準備されていません。

OVERALL ASSEMBLY (総組立)



※ This part pertains to the RE Circuit Board. (F70a)  
(この部品はREシートの付属部品です)



REF NO.	PART NO.	DESCRIPTION	部 品 名	REMARKS	QTY	ランク
* 10	VZ038700	OVERALL ASSEMBLY	総組立	MU100R J,U,E,W		
* 20	VZ019200	Top Cover	トップカバー印刷品			
* 30	VZ037900	Circuit Board	D M シ ー ト			
40	--	Circuit Board	P N J シ ー ト			
		Cord Holder	インシュロックタイ	(CB06925)	01	
50	CB502030	Cord Binder	S-75B			01
60	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	束線止め		01
70	--	Bind Head Tapping Screw-B	+ バインド B タイ		11	01
70a	VV979700	Rear Panel Assembly	リアパネル A s s ' y	(VV97850)	08	
* 70b	VV979800	Rear Panel	リ ア パ ネ ル			
		Rear Panel Sheet	リアパネルシート印刷品			
80	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	+ バインド B タイ	10	01
90	EP600190	Bind Head Tapping Screw-B	3.0X8 MFZN2BL	+ バインド B タイ	3	01
100	--	LCD Assembly	L C D A s s ' y	(VZ39490)		
110	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	+ バインド B タイ	2	01
120	--	Push Switch Unit	P S W ユ ニ ッ ト	(VZ03880)		
130	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	+ バインド B タイ	2	01
140	--	Front Assembly	フ ロ ン ト A s s ' y	U,E,W		
140	--	Front Assembly	フ ロ ン ト A s s ' y	(VZ51340)		
150	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	+ バインド B タイ	5	01
* 160	VZ025000	Circuit Board	P-VL	U,E,W		
* 170	VZ024700	Circuit Board	P-VH	U,E,W		
180	VN103500	Lithium Battery	リ チ ウ ム 電 池			03
190	--	Bottom Assembly	ボ ト ム A s s ' y	(VZ03900)		
200	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	+ バインド B タイ	10	01
210	VM825600	Input Knob	インプットツマミ	VOLUME	2	03
220	VS052100	Encoder Knob	エンコーダーツマミ	Dial		04
230	VC407100	Cord Column	D C コ ー ド コ ラ ム			02
240	EG330370	Bind Head Screw	3.0X6 MFNI33	+ バインド小ネジ	4	01
250	VZ317600	DB Cover	D B 蓋メッキ上がり	J		
* 250	VZ429300	DB Cover	D B 蓋メッキ上がり	U,E,W		
* 260	VJ999700	Bind Head Tapping Screw-C	3.0X20 MFZN2BL	+ バインド B タイ	4	
* 265	--	Spring Washer	#2 3.0 MFZN2Y	バネ座金	4	
* 270	VZ038600	Spacer	スベーサー	J	4	
280	CB825280	Clamp	CKN-05	C K N ク ラ ン プ	2	01
	--	LCD Assembly	L C D A s s ' y	(VZ39490)		
L10	VS609700	LCD	DM113Z-5BL3	液 晶 デ ィ ス プ レ イ		19
L20	VV979400	LCD Angle L		L C D ア ン グ ル L		03
L30	VV979500	LCD Angle R		L C D ア ン グ ル R		03
L40	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	+ バインド B タイ	2	01
L50	VT020800	LCD Cable	BNCD-P=1-L-16-250	L C D ケ ー ブ ル		03
* L60	VZ512500	LCD Shield Sheet		L C D シ ー ル ド シ ー ト		
	--	Push Switch Unit	P S W ユ ニ ッ ト	(VZ03880)		
P10	VV979600	Holder, Power Switch		P S W ア ン グ ル		04
P20	--	Power Switch Assembly		P S W 束線	(VZ01800)	
P20a	VP691000	Push Switch	SDDL81	プ ッ シ ュ ス W	POWER	03
P30	EG330360	Bind Head Screw	3.0X6 MFZN2BL	+ バインド小ネジ	2	01
P40	VL812900	Power Switch Knob	EMP700	P S W ノ ブ	POWER	03
	--	Front Assembly		フ ロ ン ト A s s ' y	J	
	--	Front Assembly		フ ロ ン ト A s s ' y	U,E,W	
* F10	VZ039600	Front Panel		フロントパネル印刷品	J	
* F10	VZ513300	Front Panel		フロントパネル印刷品	U,E,W	
F20	VL813000	Escutcheon, Power Switch		P S W エ ス カ ッ シ ョ ン		03
* F30	VZ019100	Circuit Board	PRSW	P R S W シ ー ト		
F40	VM825700	Mode Button		モ ー ド ボ タ ン	PLAY,EDIT,UTIL,EFFECT, MODE,EQ	6 03
* F50	VZ330900	OP Button		O P ボ タ ン	MUTE/SOLO,PARY(-,+),ENTER SELECT(<,>),EXIT, VALUE(-,+)	9
F60	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	+ バインド B タイ		4 01
F70	--	Encoder Assembly		エンコーダ A s s ' y	(VZ03970)	
* F70a	VZ037800	Circuit Board	RE	R E シ ー ト		
* F70b	VY794600	Encoder Angle		エンコーダアングル		
F80	EP600230	Bind Head Tapping Screw-B	3.0X6 MFZN2BL	+ バインド B タイ		2 01
	--	Bottom Assembly		ボ ト ム A s s ' y	(VZ03900)	
* B10	VZ040100	Bottom Cover		ボトムカバープレス品		
B20	CB037120	Foot		スベリ座	4	03

\* New Parts (新規部品)

ランク : Japan only

[illegible]

\* New Parts (新規部品)

ランク : Japan only

■ ELECTRICAL PARTS (電気部品)

REF NO.	PART NO.	DESCRIPTION		部 品 名	REMARKS	QTY	ランク
*	VZ019200	ELECTRICAL PARTS		電 気 部 品	MU100R J,U,E,W		
	VZ019100	Circuit Board	DM	D M シ ー ト	(XT446C0)		
	VZ037900	Circuit Board	PRSW	P R S W シ ー ト	(XT446C0)		
	VZ037800	Circuit Board	PNJ	P N J シ ー ト	(XS679D0)		
*	VZ025000	Circuit Board	P-VL	P - V L シ ー ト	U,E,W	(XT416B0)	
	VZ024700	Circuit Board	P-VH	P - V H シ ー ト	U,E,W	(XT415B0)	
*	VZ019200	Circuit Board	DM	D M シ ー ト	(XT446C0)		
	VZ019100	Circuit Board	PRSW	P R S W シ ー ト	(XT446C0)		
	EG330360	Bind Head Screw	3.0X6 MFZN2BL	＋ バ イ ン ド 小 ネ ジ			01
	UB012220	Monolithic Ceramic Cap.	B 220P 50V K	チ ッ プ 積 層 セ ラ コ ン			01
	UB012470	Monolithic Ceramic Cap.	B 470P 50V K	チ ッ プ 積 層 セ ラ コ ン			01
	UB013120	Monolithic Ceramic Cap.	B 1200P 50V K	チ ッ プ 積 層 セ ラ コ ン			01
	UB013220	Monolithic Ceramic Cap.	B 2200P 50V K	チ ッ プ 積 層 セ ラ コ ン			01
	UB013330	Monolithic Ceramic Cap.	B 3300P 50V K	チ ッ プ 積 層 セ ラ コ ン			01
	UB013470	Monolithic Ceramic Cap.	B 4700P 50V K	チ ッ プ 積 層 セ ラ コ ン			01
	UB051330	Monolithic Ceramic Cap.	SL 33P 50V J	チ ッ プ 積 層 セ ラ コ ン			01
	UB051470	Monolithic Ceramic Cap.	SL 47P 50V J	チ ッ プ 積 層 セ ラ コ ン			01
	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J	チ ッ プ 積 層 セ ラ コ ン			01
	UB052180	Monolithic Ceramic Cap.	SL 180P 50V J	チ ッ プ 積 層 セ ラ コ ン			01
	UB044100	Monolithic Ceramic Cap.	F 0.010 50V Z	チ ッ プ 積 層 セ ラ コ ン			01
	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z	チ ッ プ 積 層 セ ラ コ ン			01
	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z	チ ッ プ 積 層 セ ラ コ ン			01
	UI537100	Electrolytic Cap.	10.00 16.0V	ケ ミ コ ン			01
	UI537220	Electrolytic Cap.	22.00 16.0V	ケ ミ コ ン			01
	UI537470	Electrolytic Cap.	47.00 16.0V	ケ ミ コ ン			01
	UI565220	Electrolytic Cap.	0.22 50.0V	ケ ミ コ ン			01
	UI566470	Electrolytic Cap.	4.70 50.0V	ケ ミ コ ン			01
	UJ838100	Electrolytic Cap.	100.00 16.0V	ケ ミ コ ン			01
	UJ838220	Electrolytic Cap.	220.00 16.0V	ケ ミ コ ン			01
	UJ848100	Electrolytic Cap.	100.00 25.0V	ケ ミ コ ン			01
	UJ848470	Electrolytic Cap.	470.00 25.0V	ケ ミ コ ン			01
	UJ866100	Electrolytic Cap.	1.00 50.0V	ケ ミ コ ン			01
*	FP736470	Tantalum Cap.	4.70 16V M	タ ン タ ル コ ン			01
	VZ017900	Coil	180UH	コ イ ル			
	VR243700	Chip Inductance	56U LEM2520 T 560J	巻 線 チ ッ プ イ ン ダ ク タ			01
	VL139800	Solid Inductance (chip)	BLM31A700SPT 70	チ ッ プ ソ リ ッ ド イ ン ダ ク タ			01
	RD150000	Carbon Resistor (chip)	0.0 1/4 J	チ ッ プ 抵 抗			
	RD154470	Carbon Resistor (chip)	47.0 1/4 J	チ ッ プ 抵 抗			
	RD154680	Carbon Resistor (chip)	68.0 1/4 J	チ ッ プ 抵 抗			01
	RD250000	Carbon Resistor (chip)	0.0 0.0 J	チ ッ プ 抵 抗			01
	RD254470	Carbon Resistor (chip)	47.0 0.1 J	チ ッ プ 抵 抗			01
	RD254560	Carbon Resistor (chip)	56.0 0.1 J	チ ッ プ 抵 抗			01
	RD254680	Carbon Resistor (chip)	68.0 0.1 J	チ ッ プ 抵 抗			01
	RD255100	Carbon Resistor (chip)	100.0 0.1 J	チ ッ プ 抵 抗			01
	RD255220	Carbon Resistor (chip)	220.0 0.1 J	チ ッ プ 抵 抗			01
	RD255470	Carbon Resistor (chip)	470.0 0.1 J	チ ッ プ 抵 抗			01
	RD255680	Carbon Resistor (chip)	680.0 0.1 J	チ ッ プ 抵 抗			01
	RD256100	Carbon Resistor (chip)	1.0K 0.1 J	チ ッ プ 抵 抗			01
	RD256160	Carbon Resistor (chip)	1.6K 0.1 J	チ ッ プ 抵 抗			01
	RD256200	Carbon Resistor (chip)	2.0K 0.1 J	チ ッ プ 抵 抗			01
	RD256240	Carbon Resistor (chip)	2.4K 0.1 J	チ ッ プ 抵 抗			01
	RD256300	Carbon Resistor (chip)	3.0K 0.1 J	チ ッ プ 抵 抗			01
	RD256330	Carbon Resistor (chip)	3.3K 0.1 J	チ ッ プ 抵 抗			01
	RD256360	Carbon Resistor (chip)	3.6K 0.1 J	チ ッ プ 抵 抗			01
	RD256470	Carbon Resistor (chip)	4.7K 0.1 J	チ ッ プ 抵 抗			01
	RD257100	Carbon Resistor (chip)	10.0K 0.1 J	チ ッ プ 抵 抗			01
	RD257150	Carbon Resistor (chip)	15.0K 0.1 J	チ ッ プ 抵 抗			01
	RD257220	Carbon Resistor (chip)	22.0K 0.1 J	チ ッ プ 抵 抗			01
	RD257360	Carbon Resistor (chip)	36.0K 0.1 J	チ ッ プ 抵 抗			01
	RD257470	Carbon Resistor (chip)	47.0K 0.1 J	チ ッ プ 抵 抗			01
	RD258100	Carbon Resistor (chip)	100.0K 0.1 J	チ ッ プ 抵 抗			01
	RD258120	Carbon Resistor (chip)	120.0K 0.1 J	チ ッ プ 抵 抗			01
	RD258680	Carbon Resistor (chip)	680.0K 0.1 J	チ ッ プ 抵 抗			01
*	RE044680	Resistor Array	68X4	抵 抗 ア レ イ			01
	RE045100	Resistor Array	100X4	抵 抗 ア レ イ			01
	RE045180	Resistor Array	180X4	抵 抗 ア レ イ			01
	RE046470	Resistor Array	4.7KX4	抵 抗 ア レ イ			01
	RE047100	Resistor Array	10KX4	抵 抗 ア レ イ			01

\* New Parts (新規部品)

ランク : Japan only

REF NO.	PART NO.	DESCRIPTION	部 品 名	REMARKS	QTY	ランク
*	RE047220	Resistor Array	22KX4	抵 抗 ア レ イ		01
	XF291A00	IC	UPC4570G2	イ		03
	XS893A00	IC	TL32088	抵 抗 ア レ イ		
	XJ598A00	IC	NJM78L05UA	イ		02
*	XS516A00	IC	UPC2933T	イ		03
	XT441A00	IC	UPC2909T	抵 抗 ア レ イ		
	XT442A00	IC	SI-8050S	イ		05
	XP596A00	IC	NJU7660M-T1	イ		04
*	XD603A00	IC	TC74HC245F-T1	イ		02
	XD657A00	IC	TC74HC14AF-TP1	イ		
	XG385A00	IC	TC74HC4066AF-T1	イ		02
	XH223A00	IC	SN74HC273NSR	イ		01
*	XI348A00	IC	SC7SU04FEL	イ		01
	XM588A00	IC	TC7S32F	イ		01
	XN883A00	IC	TC7W14FU	イ		02
	XP881A00	IC	MC34051MEL	イ		05
*	XR056A00	IC	TC74HC4051AF-TP	イ		02
	XR682A00	IC	TC7S66F	イ		01
	XS048A00	IC	HD74LVC139FP	イ		03
	XS776A00	IC	TC74HC126AF	イ		02
*	XR738A00	IC	TC203C760HF-001	イ		20
	XS725A00	IC	TC203C760HF-002	イ		19
	XT443A00	IC	HD6432653(16M)	イ		
	XS438A00	IC	M5M44260CTP-7	イ		16
*	XS518A00	IC	KM23C32000AG-4J	イ		13
	XS681A00	IC	M5M51008BFP-70LLT	イ		11
	XS743A00	IC	KM23C32000AG-5J	イ		13
	XT445A00	IC	23C16000WGY828	イ		
*	XT461A00	IC	23C16000WGY829	イ		
	XT714E00	IC	312V100	イ		
	XI686A00	IC	M62021FP	イ		04
	XS892A00	IC	TLC320AD58C	イ		
*	LB918030	Base Post Connector	XH 3P TE	ベースツキポスト		01
	VB389900	Connector Base Post	PH- 3P TE	コネクタベースポスト		01
	VB390000	Connector Base Post	PH 4P TE	コネクタベースポスト		01
	VF667600	Connector	52147 15P TE	コネクタ		01
*	VF667700	Connector	52147 17P TE	コネクタ		01
	VI879500	Cable Holder	51048 17P TE	ケーブルホルダー		01
	VS666700	Connector	SLW 16P TE	コネクタ		02
	VK863100	IC Socket	DICF-42CS-E	ICソケット		03
*	VN103600	Battery Holder	CR2032	バッテリーホルダー		03
	VG238200	LC Filter	PLT2003C	LCフィルター EMI		04
	VR193800	LC Filter	STF-104ZB-TBM	LCフィルター EMI		01
	VP864900	Quartz Crystal Unit	16M SMD-49	水晶振動子		04
*	VV345500	Quartz Crystal Unit	DOC-49S5	水晶発振器		05
	VD456900	Transistor	2SCDTC143XK	トランジスタ		01
	VB493900	Diode	MA221	ダイオード		01
	VS201100	Diode	D1F60	ダイオード		01
*	VZ016600	Diode	D3FP3	ダイオード		
	VU171500	Zener Diode	UDZ 3.6BTE-17 3.6V	ツェナーダイオード		01
*	VN686000	Photo Coupler	PC410T	フォトカプラー		04
	VV488200	Holder, Jack		J K ア ン グ ル		03
	--	Connector Assembly	15P-210	P S R 2 束 線	(VZ31070)	
	--	Connector Assembly	10P	S W 1 束 線	(VZ02020)	
*	--	Connector Assembly	7P	S W 2 束 線	(VZ02070)	
	--	Connector Assembly	15P-210	X W P S 束 線	(VZ03760)	
	BA808520	Heat Sink	T220M 25L	ヒートシンク		03
JK1	VM761000	DIN Connector	DIN 8P MD-S810	複 合 コ ネ ク タ	TO HOST	03
JK2	VJ885500	DIN Connector	3P YKF51-5054	D I N コ ネ ク タ	MIDI IN(A,B)	04
JK3	VJ885500	DIN Connector	3P YKF51-5054	D I N コ ネ ク タ	MIDI (OUT,THRU)	04
JK6	VT160000	Phone Jack	YKB26-5218	ホ ー ン ジャ ッ ク	A/D INPUT 2	05
JK8	VJ207400	DC-IN Connector	16V DC 3A HEC2305	D C ジャ ッ ク	DC IN	01
VR1	VS666800	Rotary Variable Resistor	RK09K12A0A6CA	二 連 ロ ー タ リ ー V R	A/D INPUT VOLUME	03
SW16	VK701100	Push Switch	SKHQFN GREEN	プ ッ シ ュ S W	PLAY	02
SW17	VK701100	Push Switch	SKHQFN GREEN	プ ッ シ ュ S W	EDIT	02
SW18	VK701100	Push Switch	SKHQFN GREEN	プ ッ シ ュ S W	UTIL	02
SW19	VK701100	Push Switch	SKHQFN GREEN	プ ッ シ ュ S W	EFFECT	02
SW20	VK701100	Push Switch	SKHQFN GREEN	プ ッ シ ュ S W	MODE	02
SW21	VK701100	Push Switch	SKHQFN GREEN	プ ッ シ ュ S W	EQ	02
SW22	VN121700	Push Switch	SKHHP	プ ッ シ ュ S W	MUTE/SOLO	01

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REF NO.	PART NO.	DESCRIPTION		部 品 名	REMARKS	QTY	ランク
SW23	VN121700	Push Switch	SKHHPP	プ ッ シ ユ S W	PLAY -		01
SW24	VN121700	Push Switch	SKHHPP	プ ッ シ ユ S W	PLAY +		01
SW25	VN121700	Push Switch	SKHHPP	プ ッ シ ユ S W	ENTER		01
SW26	VN121700	Push Switch	SKHHPP	プ ッ シ ユ S W	SELECT <		01
SW27	VN121700	Push Switch	SKHHPP	プ ッ シ ユ S W	SELECT >		01
SW28	VN121700	Push Switch	SKHHPP	プ ッ シ ユ S W	EXIT		01
SW29	VN121700	Push Switch	SKHHPP	プ ッ シ ユ S W	VALUE -		01
SW30	VN121700	Push Switch	SKHHPP	プ ッ シ ユ S W	VALUE +		01
SW31	VQ665200	Slide Switch	SSSF144-S06N-0	ス ラ イ ド S W	HOST SELECT		03
*	VZ037900	Circuit Board	PNJ	P N J シ ー ト	(XS679D0)		
	VZ037800	Circuit Board	RE	R E シ ー ト	(XS679D0)		
	CB069250	Cord Holder	BK-1	インシュロックタイ			01
	UB012270	Monolithic Ceramic Cap.	B 270P 50V K	チップ積層セラコン			01
	UB013100	Monolithic Ceramic Cap.	B 1000P 50V K	チップ積層セラコン			01
	UB013220	Monolithic Ceramic Cap.	B 2200P 50V K	チップ積層セラコン			01
	UB013680	Monolithic Ceramic Cap.	B 6800P 50V K	チップ積層セラコン			01
	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J	チップ積層セラコン			01
	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z	チップ積層セラコン			01
	VQ686200	Monolithic Ceramic Cap.	F 1.0 16V Z	チップ積層セラコン			01
	UJ837100	Electrolytic Cap.	10.00 16.0V	ケ ミ コ ン			01
	UJ837220	Electrolytic Cap.	22.00 16.0V	ケ ミ コ ン			01
	UJ837470	Electrolytic Cap.	47.00 16.0V	ケ ミ コ ン			01
	UJ838100	Electrolytic Cap.	100.00 16.0V	ケ ミ コ ン			01
	UJ838220	Electrolytic Cap.	220.00 16.0V	ケ ミ コ ン			01
	UJ866100	Electrolytic Cap.	1.00 50.0V	ケ ミ コ ン			01
	UJ866470	Electrolytic Cap.	4.70 50.0V	ケ ミ コ ン			01
	VR243700	Chip Inductance	56U LEM2520 T 560J	巻線チップインダクタ			01
	VC362700	Ferrite Core	FR25/15/12-1400L	フェライトコア			04
	VL139800	Solid Inductance (chip)	BLM31A700SPT 70	チップソリッドインダクタ			01
	RD150000	Carbon Resistor (chip)	0.0 1/4 J	チ ッ プ 抵 抗			
	RD153470	Carbon Resistor (chip)	4.7 1/4 J	チ ッ プ 抵 抗			01
	RD154470	Carbon Resistor (chip)	47.0 1/4 J	チ ッ プ 抵 抗			
	RD155470	Carbon Resistor (chip)	470.0 1/4 J	チ ッ プ 抵 抗			
	RD250000	Carbon Resistor (chip)	0.0 0.0 J	チ ッ プ 抵 抗			01
	RD254100	Carbon Resistor (chip)	10.0 0.1 J	チ ッ プ 抵 抗			01
	RD254680	Carbon Resistor (chip)	68.0 0.1 J	チ ッ プ 抵 抗			01
	RD255150	Carbon Resistor (chip)	150.0 0.1 J	チ ッ プ 抵 抗			01
	RD256100	Carbon Resistor (chip)	1.0K 0.1 J	チ ッ プ 抵 抗			01
	RD256150	Carbon Resistor (chip)	1.5K 0.1 J	チ ッ プ 抵 抗			01
	RD256680	Carbon Resistor (chip)	6.8K 0.1 J	チ ッ プ 抵 抗			01
	RD256820	Carbon Resistor (chip)	8.2K 0.1 J	チ ッ プ 抵 抗			01
	RD257100	Carbon Resistor (chip)	10.0K 0.1 J	チ ッ プ 抵 抗			01
	RD257120	Carbon Resistor (chip)	12.0K 0.1 J	チ ッ プ 抵 抗			01
	RD257220	Carbon Resistor (chip)	22.0K 0.1 J	チ ッ プ 抵 抗			01
	RD257240	Carbon Resistor (chip)	24.0K 0.1 J	チ ッ プ 抵 抗			01
	RD257470	Carbon Resistor (chip)	47.0K 0.1 J	チ ッ プ 抵 抗			01
	RD258100	Carbon Resistor (chip)	100.0K 0.1 J	チ ッ プ 抵 抗			01
	XF291A00	IC	UPC4570G2	I C	OP AMP		03
	XQ138A00	IC	NJM4556AMT1	I C	SOP		03
	XM927A00	IC	AN78L05-(TA)	I C	REGULATOR +5V		01
	XM968B00	IC	UPC24M09AHF:	I C	REGULATOR +9V		03
	XC726A00	IC	SN74HC74NSR	I C	DFF		01
	XR336A00	IC	TC7W14F	I C	TE12L INVERTER		02
	XM145A00	IC	UPD63200GS	I C	DA CONVERTER		07
	XM326B00	IC	JG710069	I C	DDE1		
	VI878300	Cable Holder	51048 5P TE	ケーブルホルダー			01
	VI879500	Cable Holder	51048 17P TE	ケーブルホルダー			01
	VK024900	Wire Trap	52147 5P TE	ワイヤートラップ			01
	FZ006970	LC Filter	LS MT Y223NB	L C フィルター E M I			02
	VR193800	LC Filter	STF-104ZB-TBM	L C フィルター E M I			01
	VV483200	Rotary Variable Resistor	RK09K12A0	二連ロータリー V R			03
	VJ927200	Transistor	2SA1162 O,Y	ト ラ ン ジ ス タ			01
	VD303700	Transistor	2SC3326 A,B TE85R	ト ラ ン ジ ス タ			01
	VB493900	Diode	MA221	ダ イ オード			01
	VS201100	Diode (chip)	D1F60	チップダイオード			01
	VV916900	Holder, Jack		J K ア ン グ ル			03
	--	Connector Assembly		A D I N 束 線	(VV95090)		
	--	Connector Assembly	10P	S W 3 束 線	(VZ02050)		
	--	Connector Assembly	5P	S W 4 束 線	(VZ02100)		

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